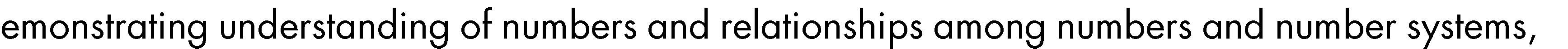
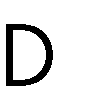
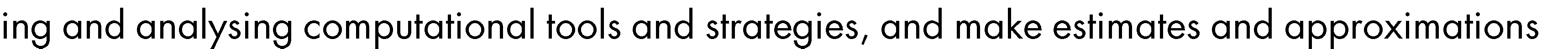
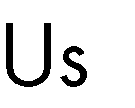
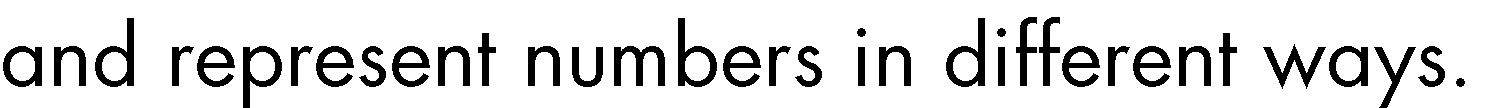
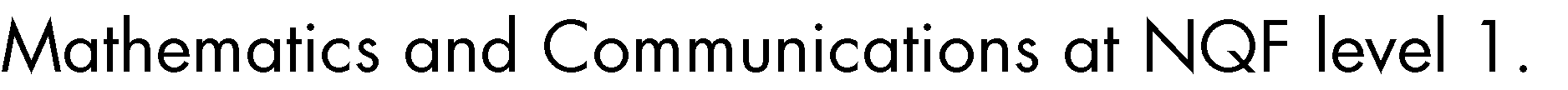
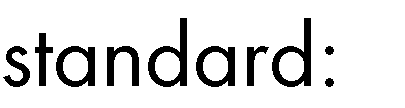
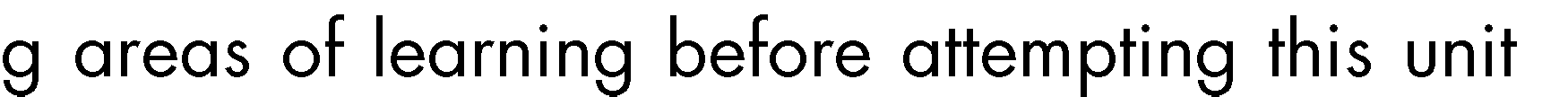
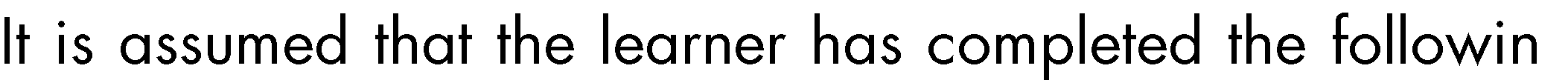
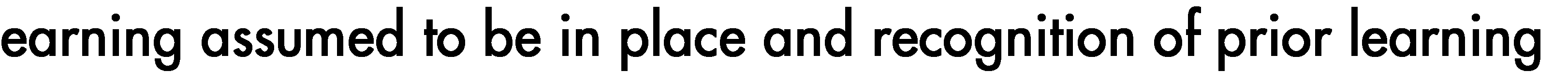
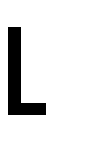
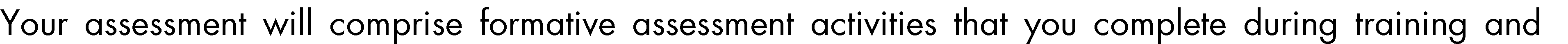
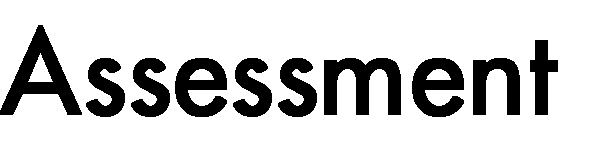


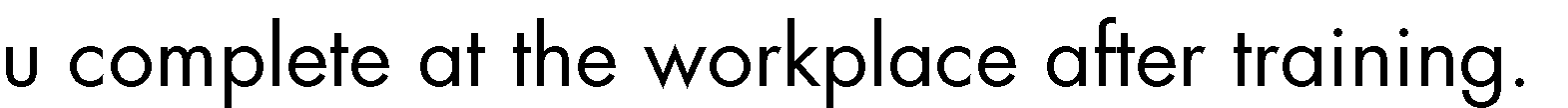
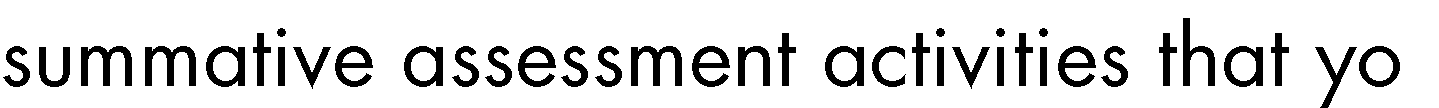
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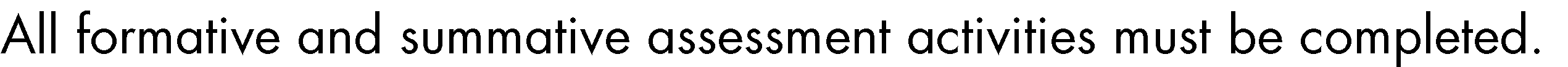


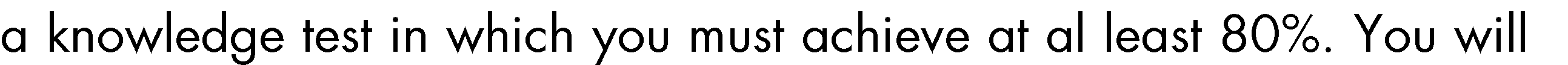
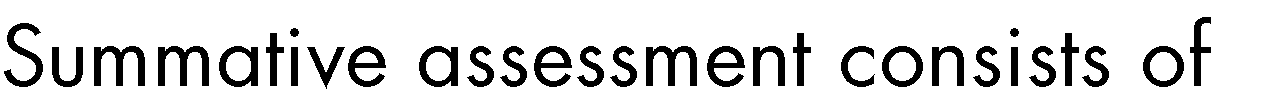
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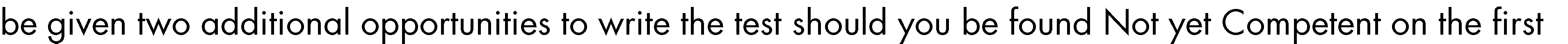


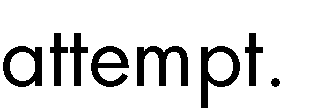


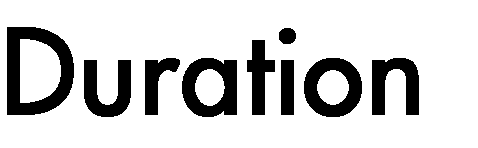


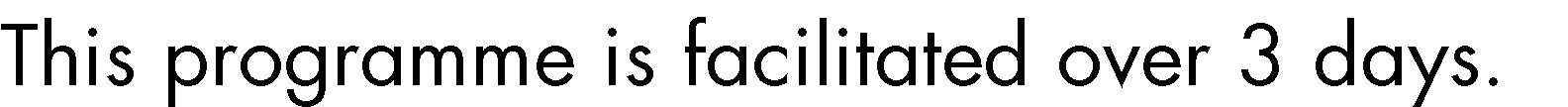








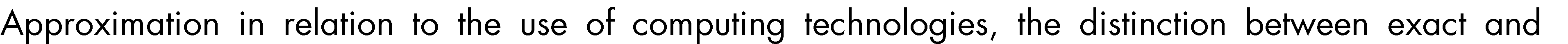
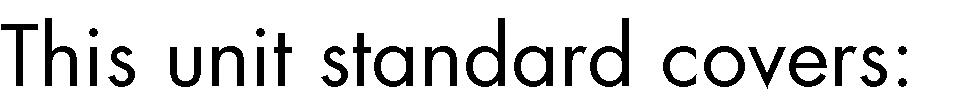


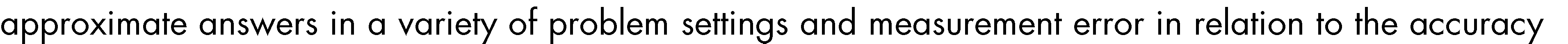


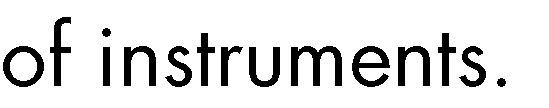
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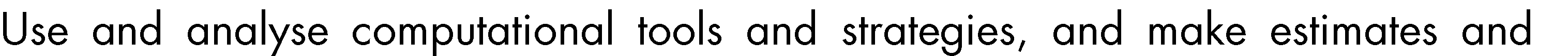
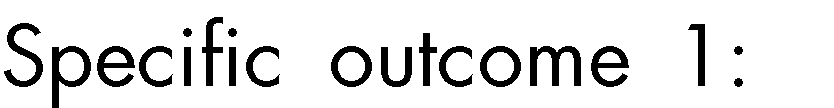


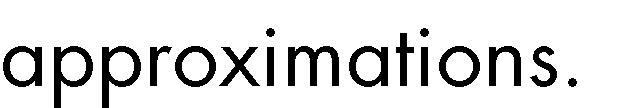


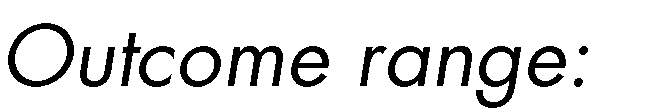




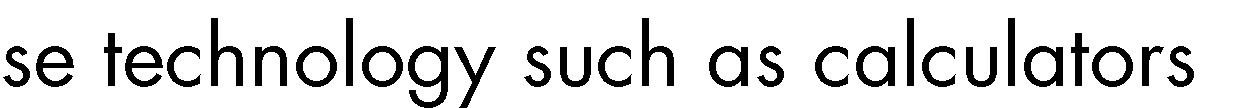
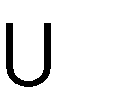
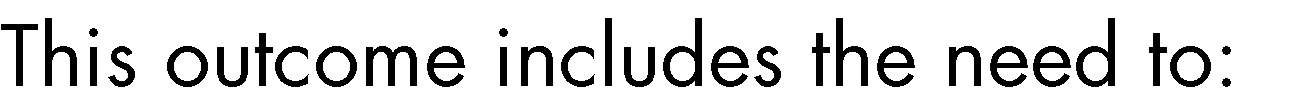


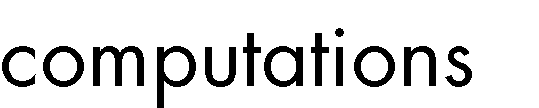


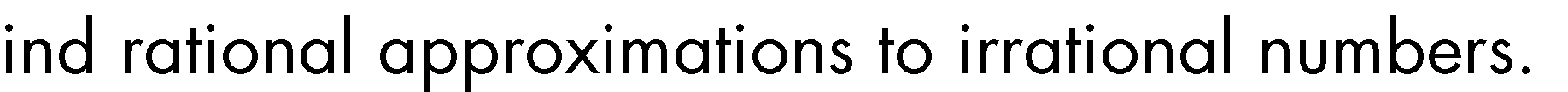
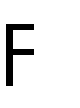
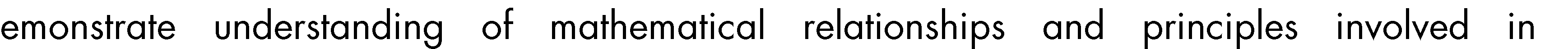
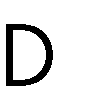




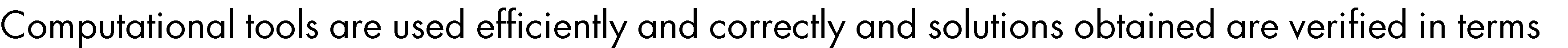
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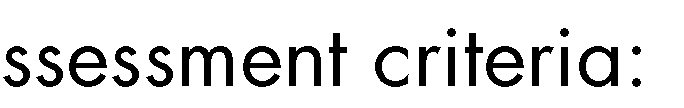
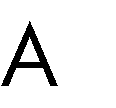


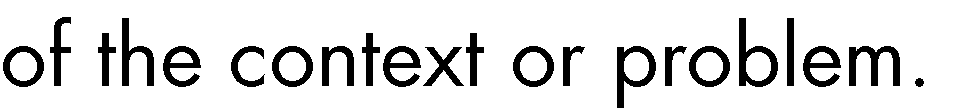
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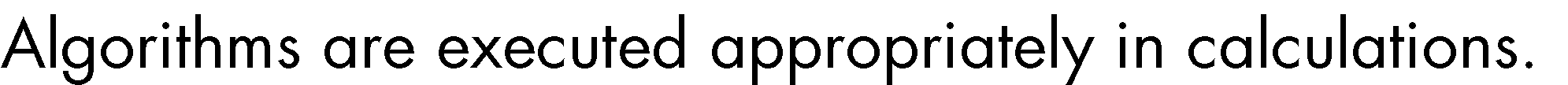


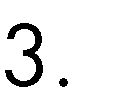
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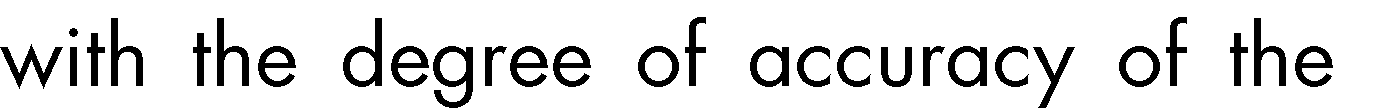
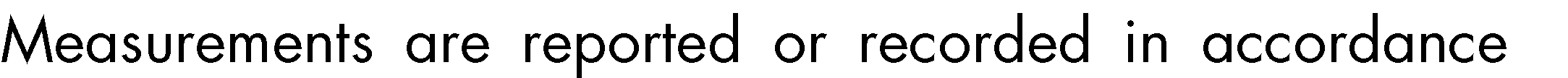


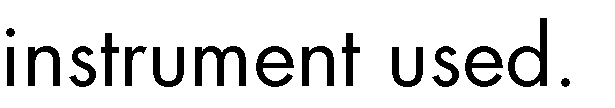


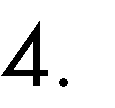
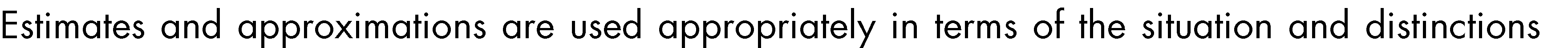


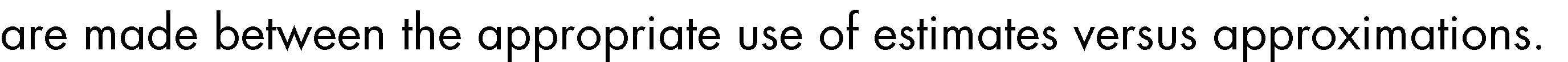
 

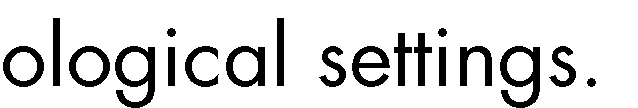
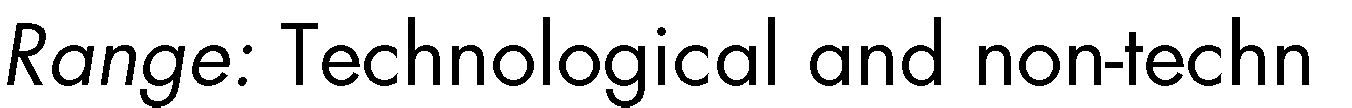


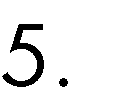
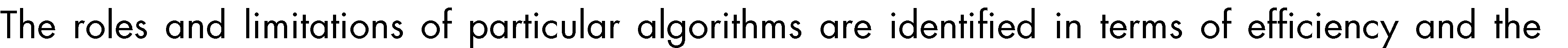


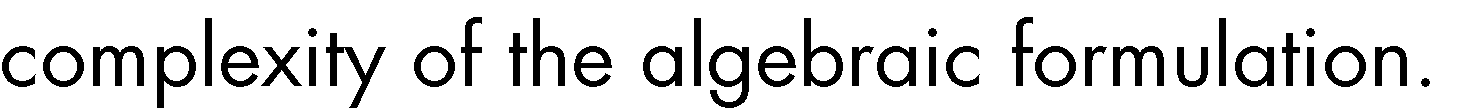


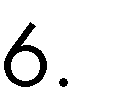
 

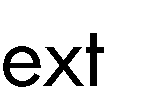
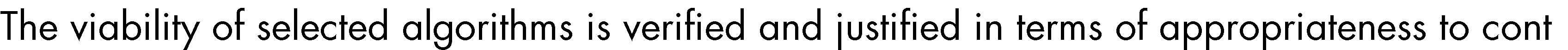


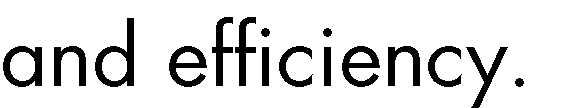


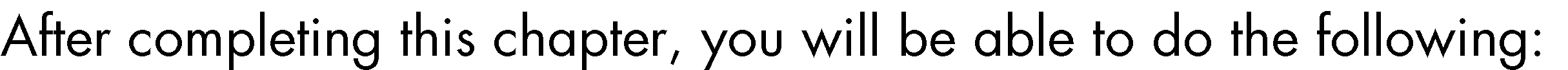


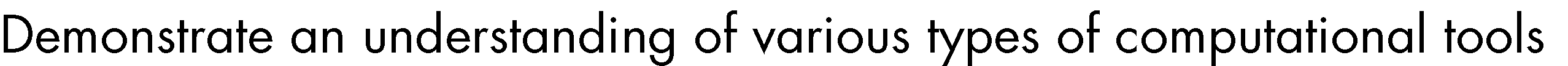


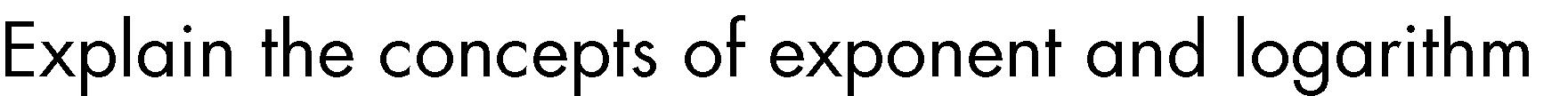


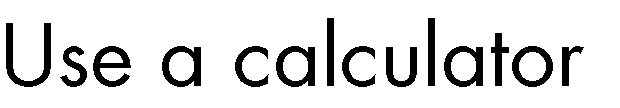




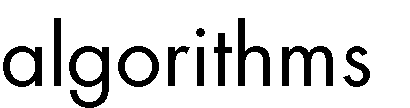
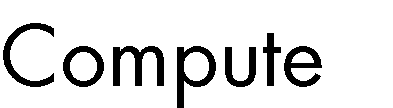


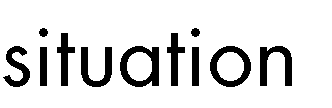
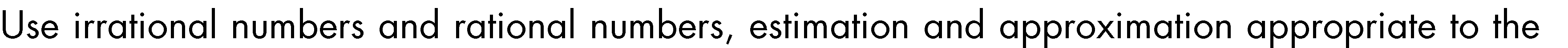
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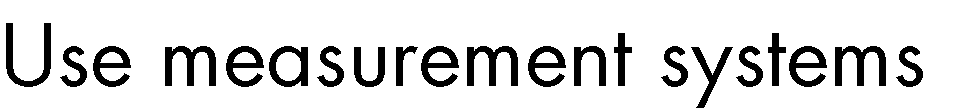
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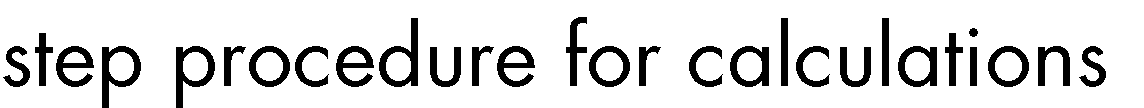
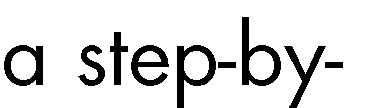
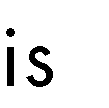
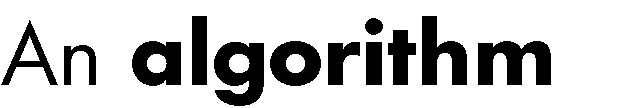
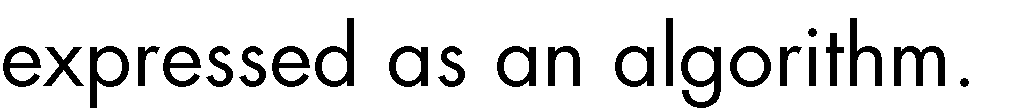
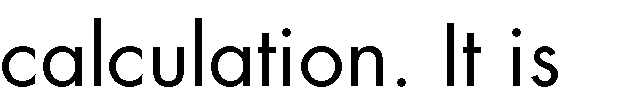
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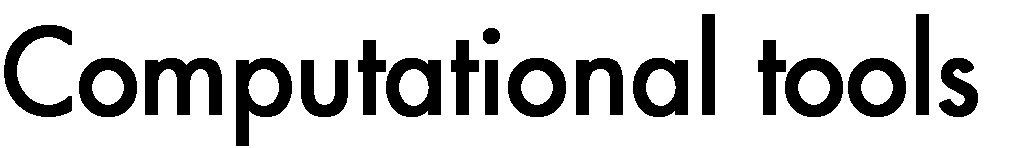
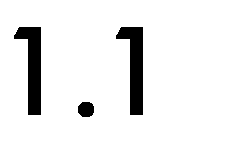
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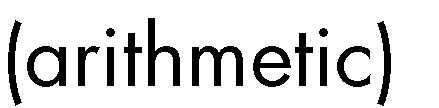
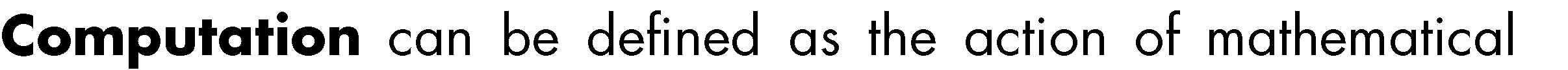


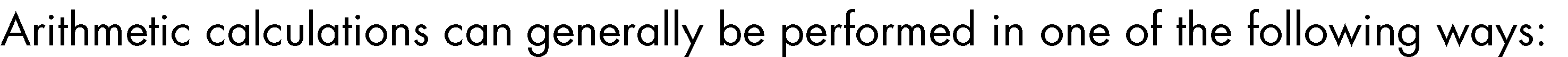
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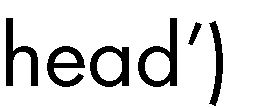
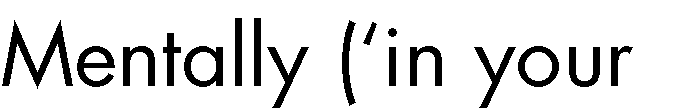
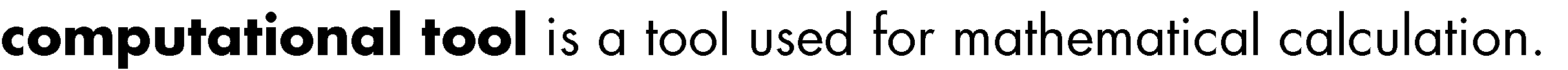
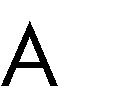


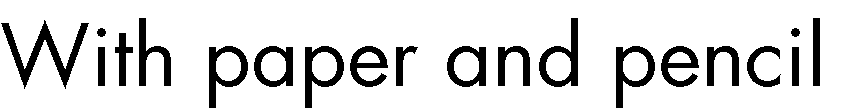


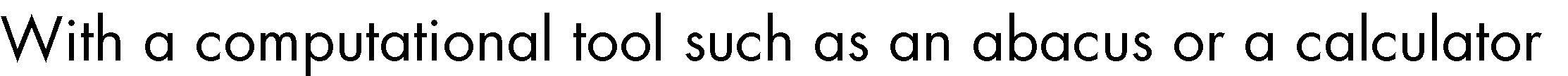




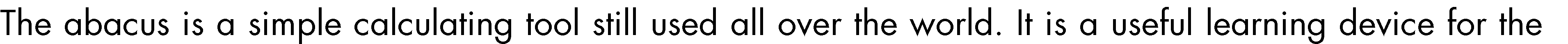
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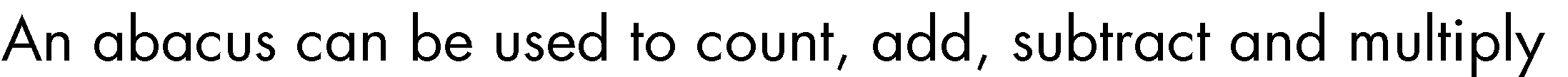
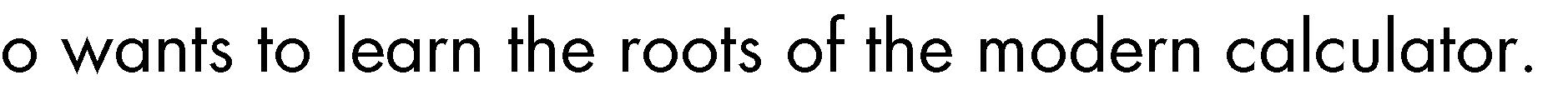
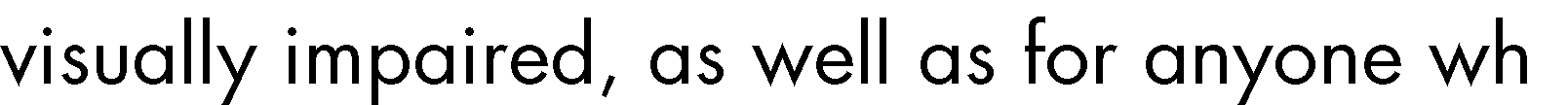


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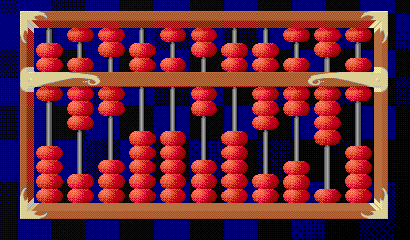
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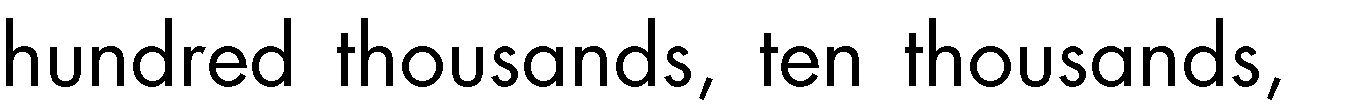
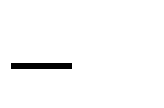
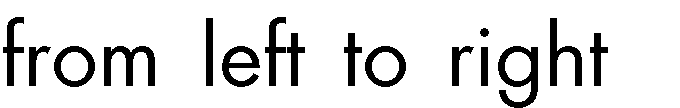
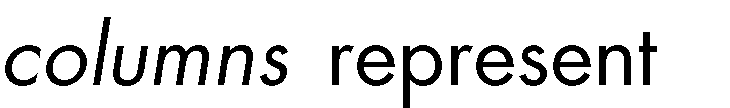
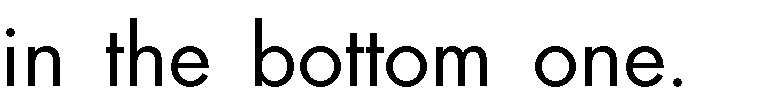
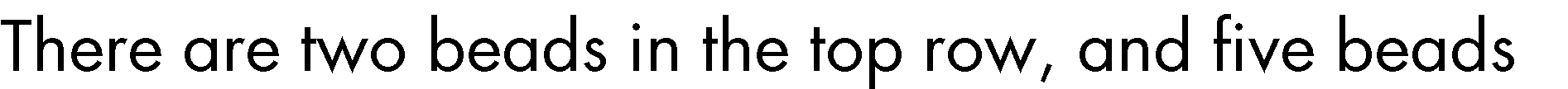
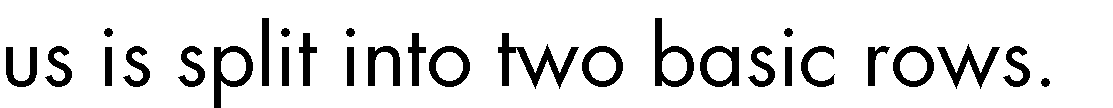
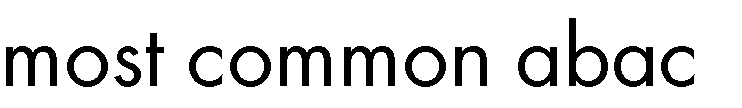
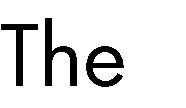
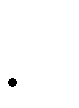
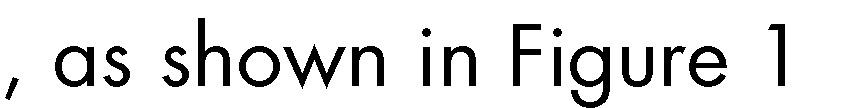
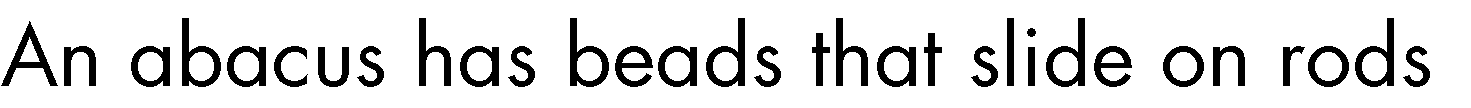
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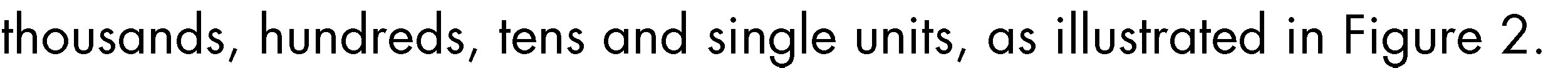


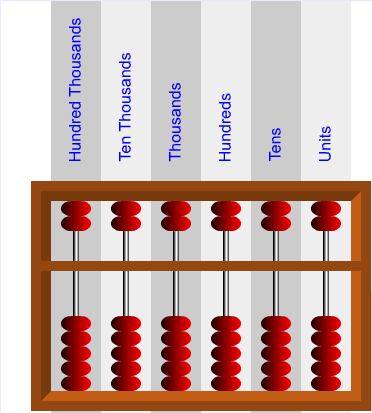


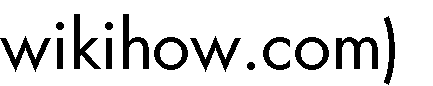
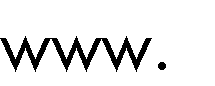
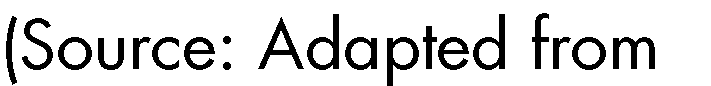
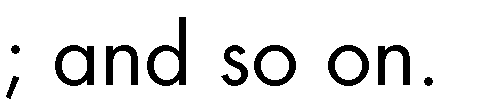
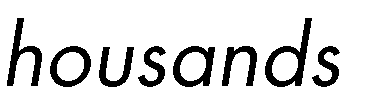
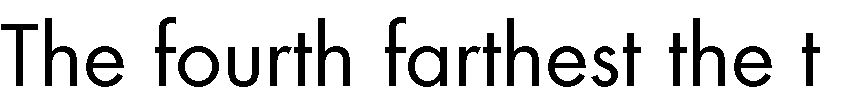
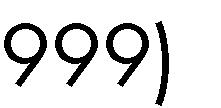
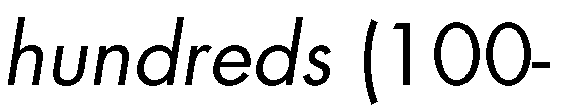
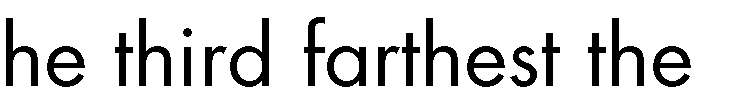
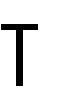
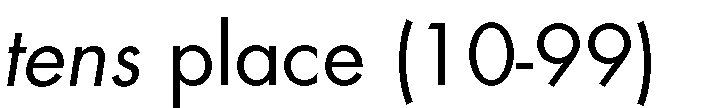
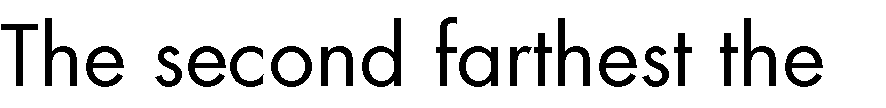
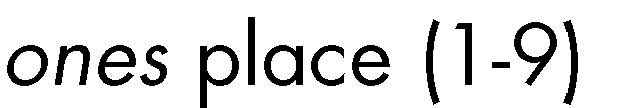
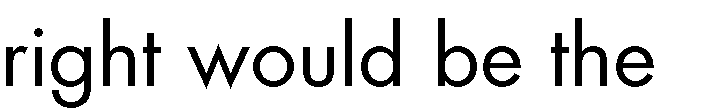
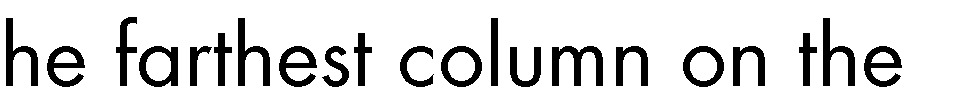
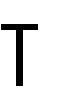
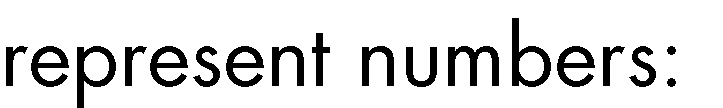
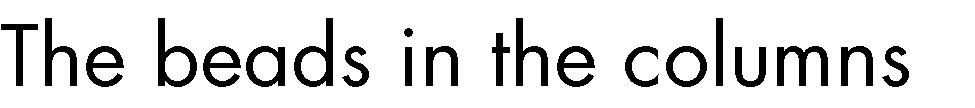
How the abacus is constructed and used



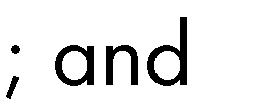
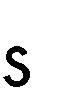
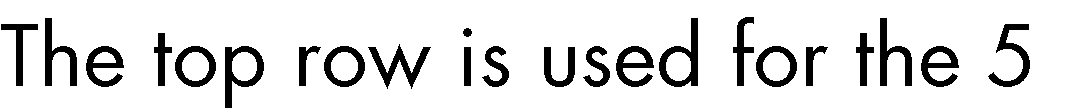




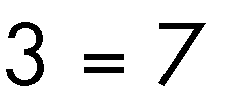
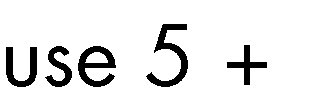
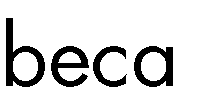
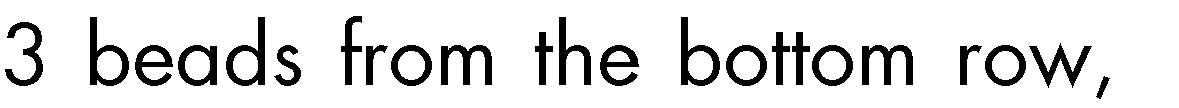
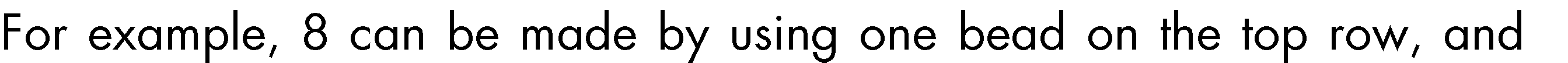
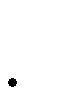
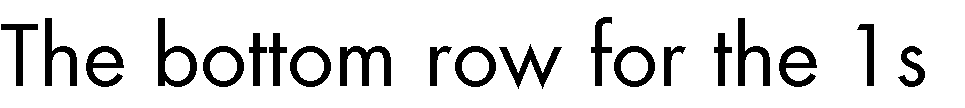


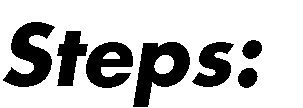


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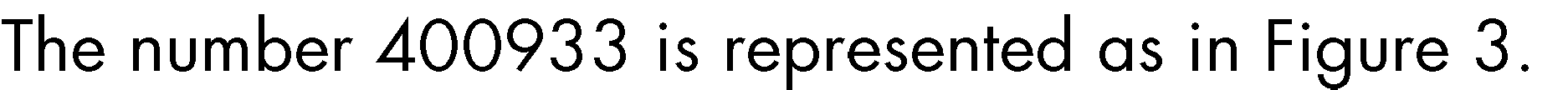
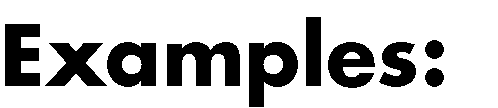


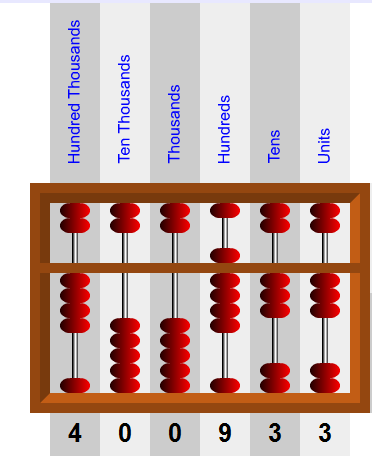
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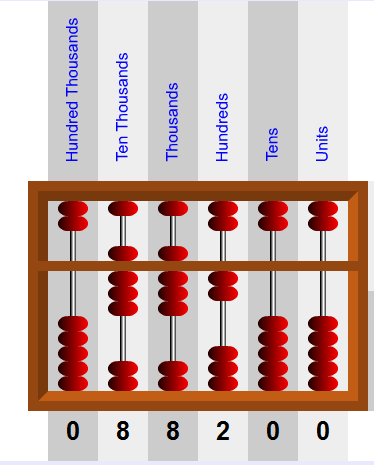
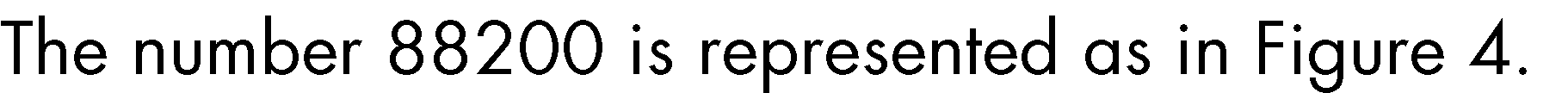


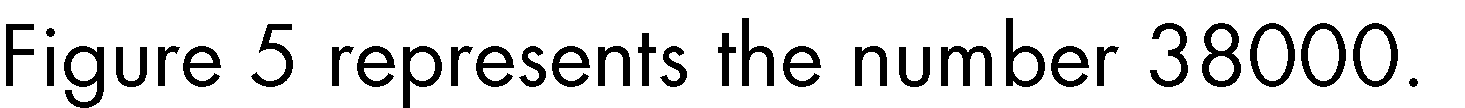
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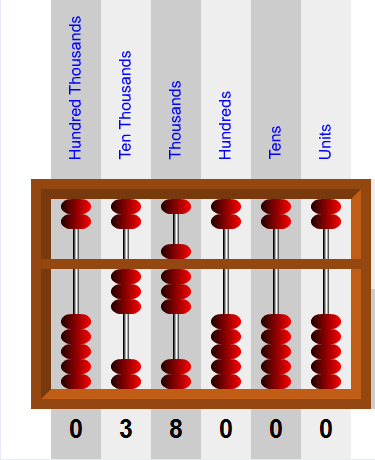




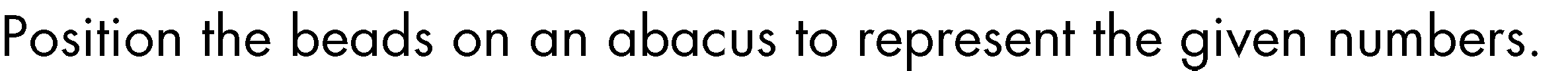
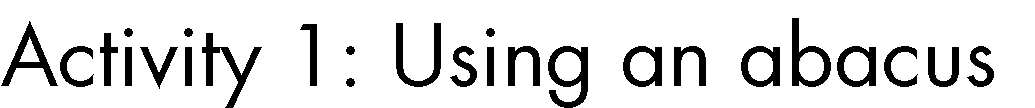






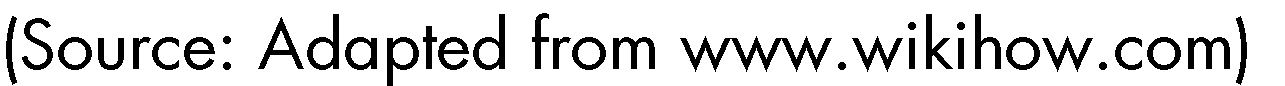


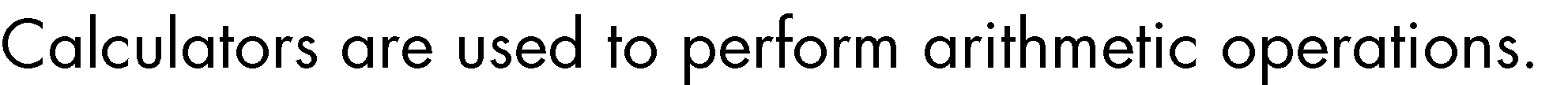


Adding and subtracting with the abacus

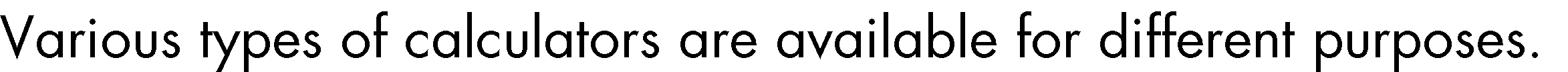
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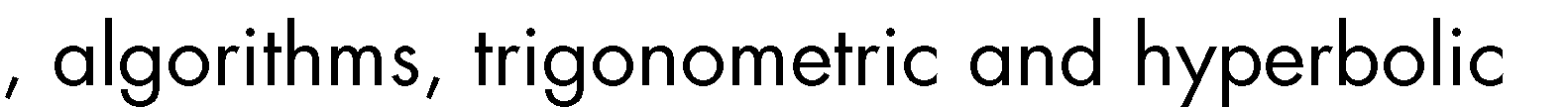
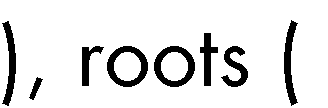
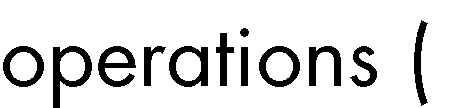
* + 1. Calculators



Types of calculators

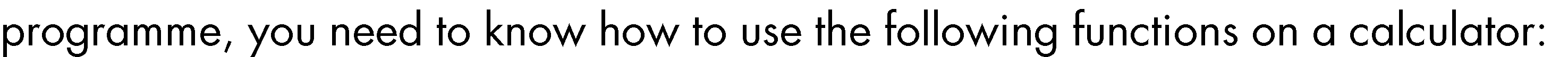
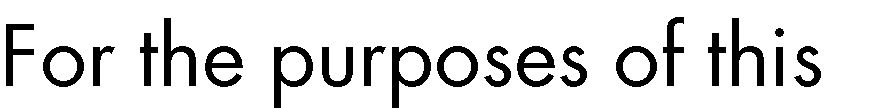


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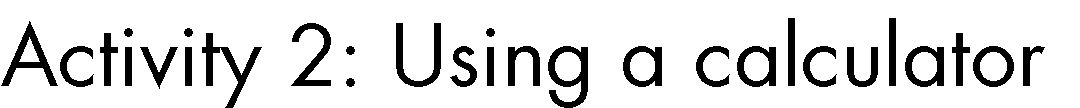


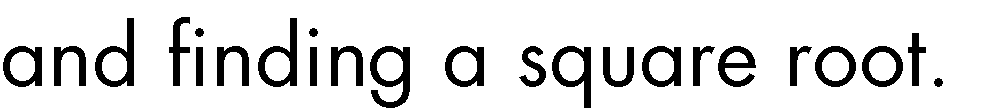
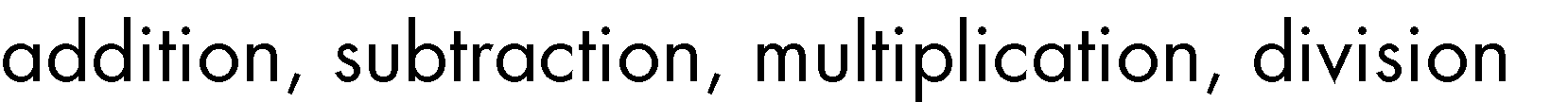
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The functions of a calculator

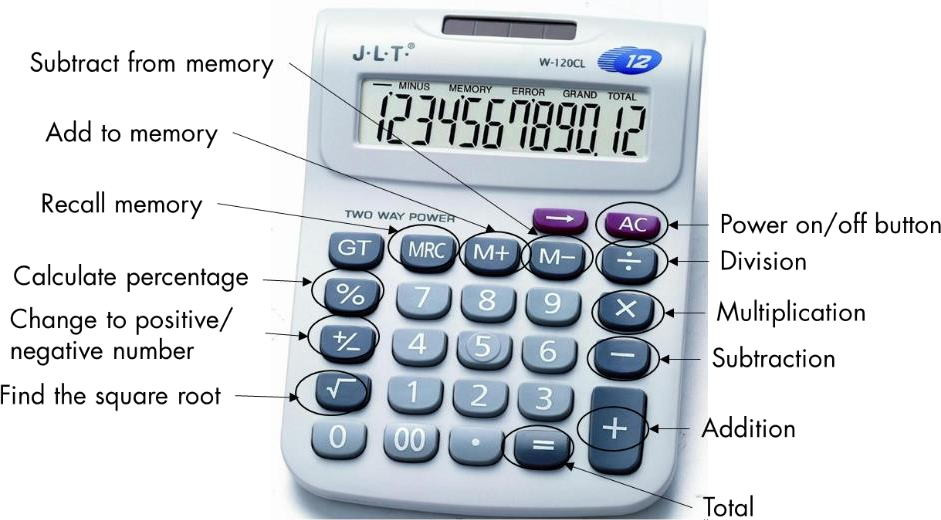


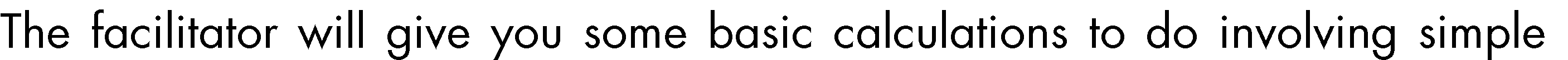
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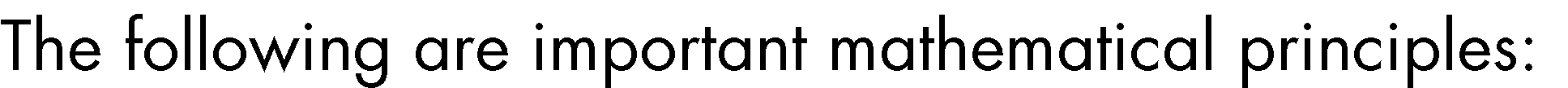
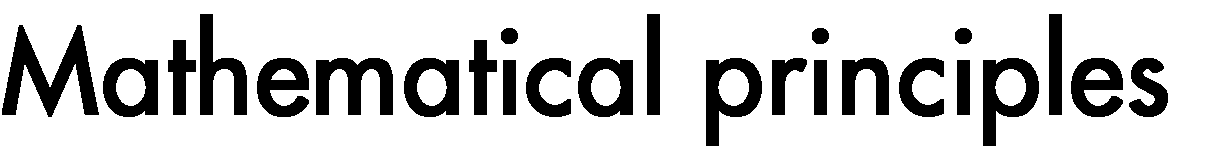
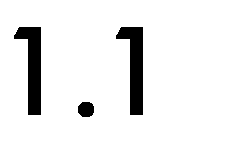


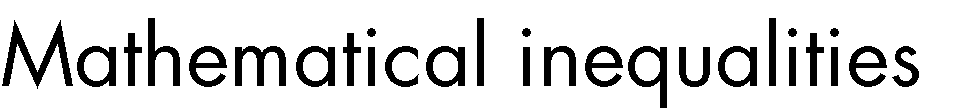


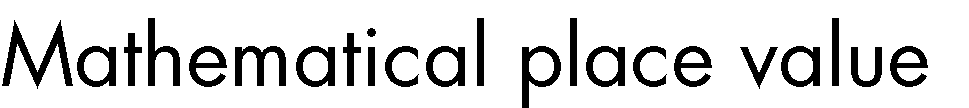
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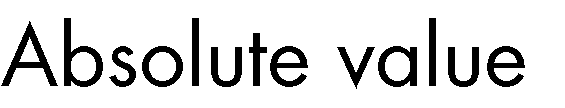


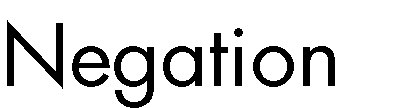




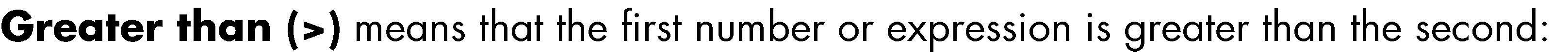
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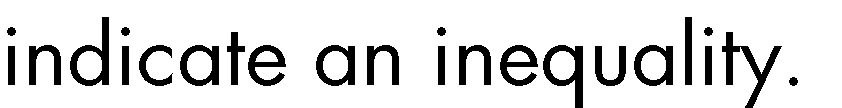
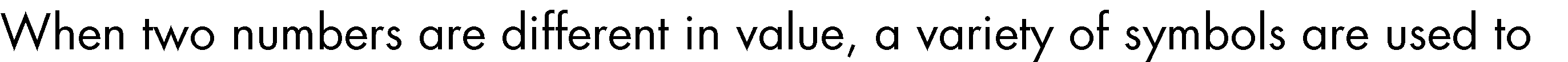
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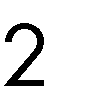
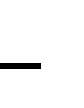
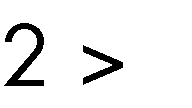
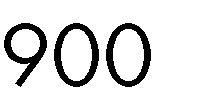
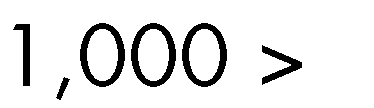
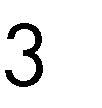
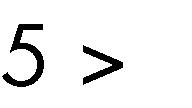
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* + 1. Mathematical inequalities



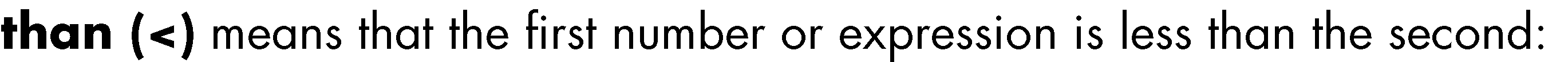
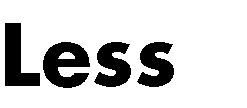


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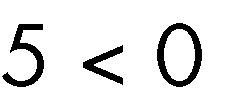
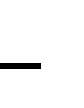
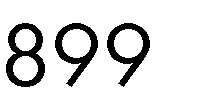
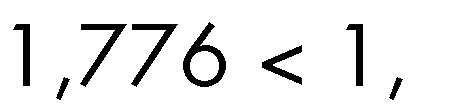
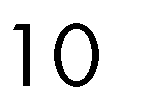
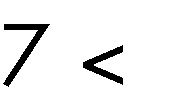


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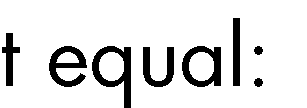
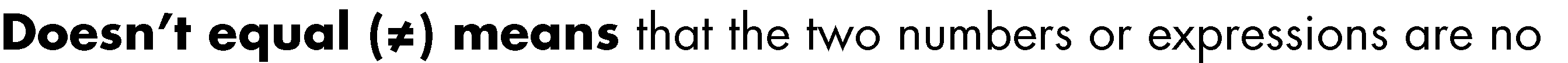


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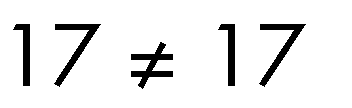
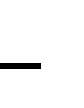
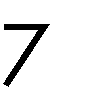
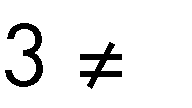
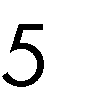
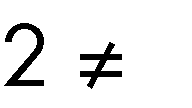


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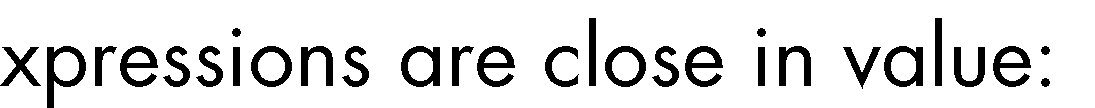
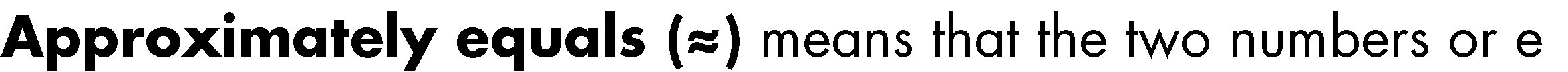


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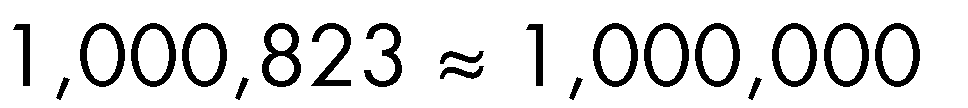
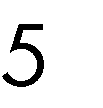
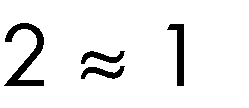
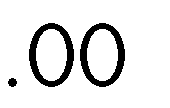
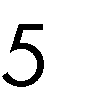
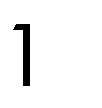
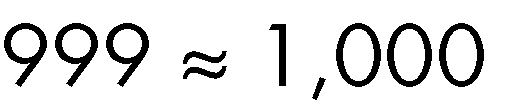


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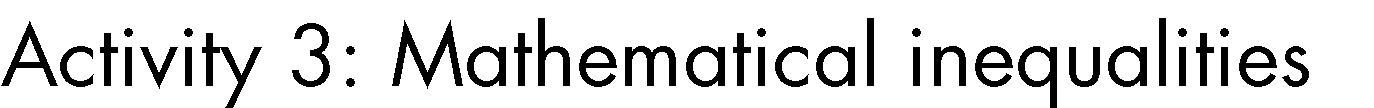
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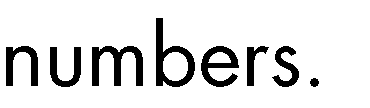
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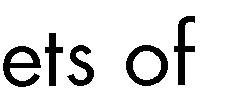
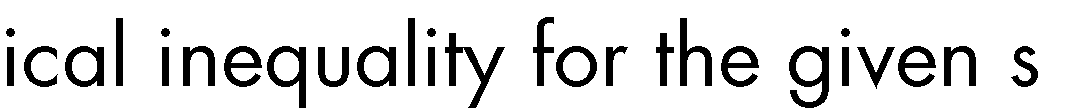
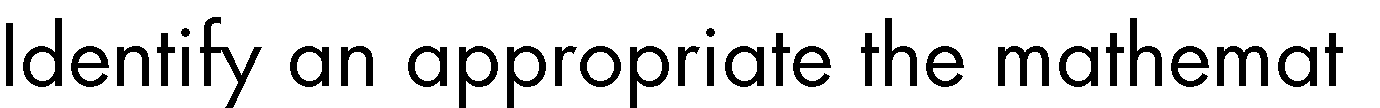


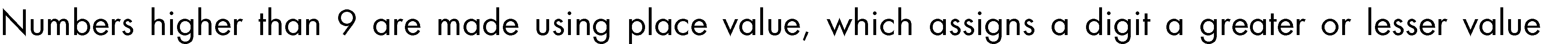
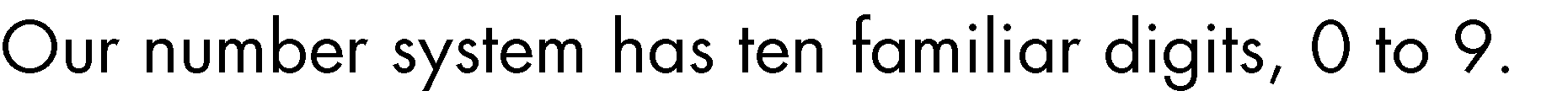
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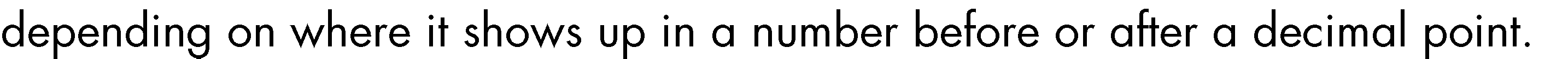
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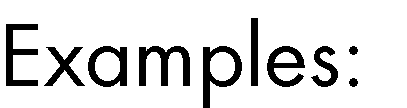


* + 1. Mathematical place value

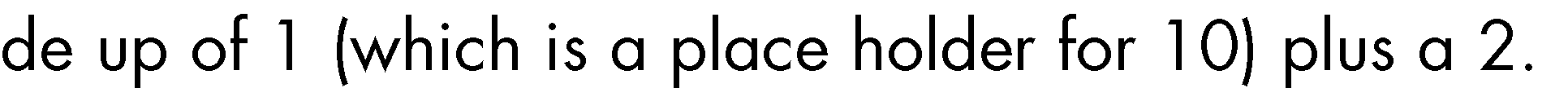
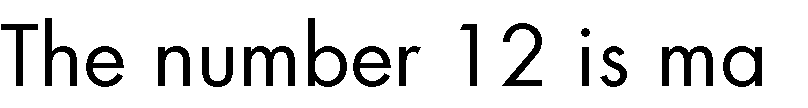


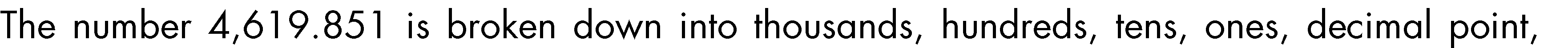
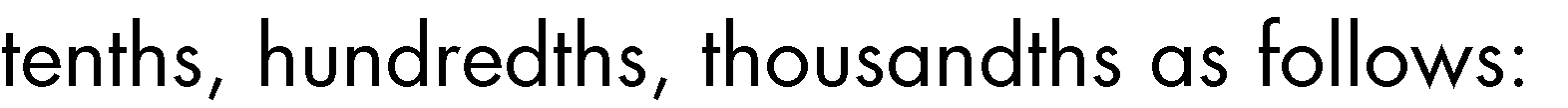


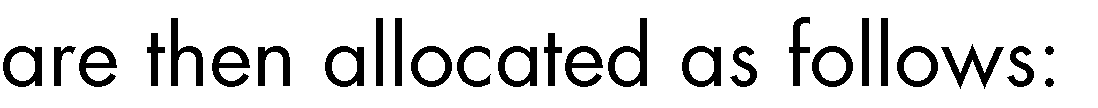
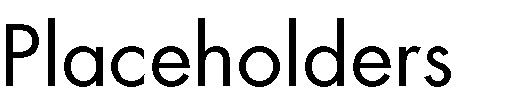
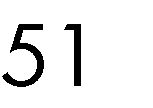
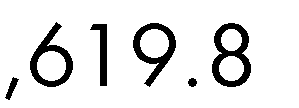
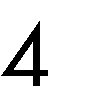
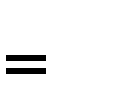
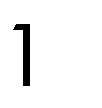
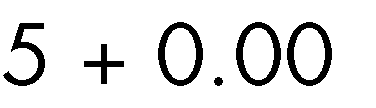
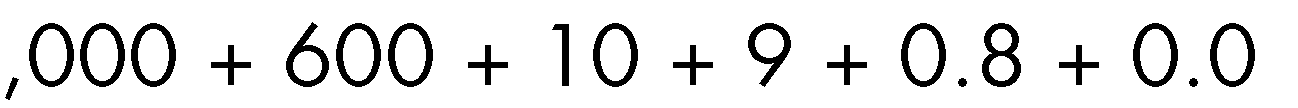
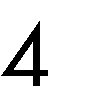




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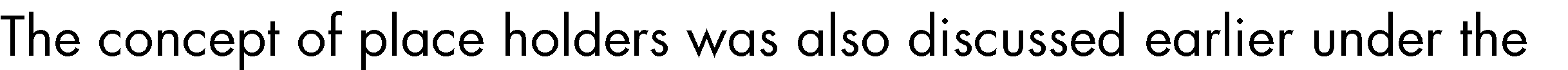


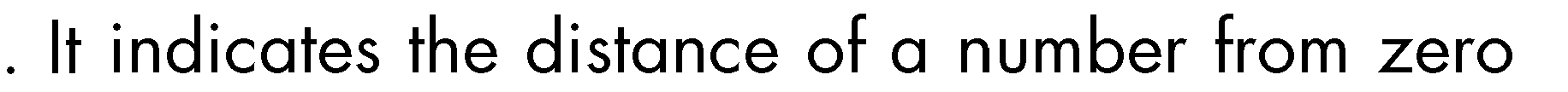
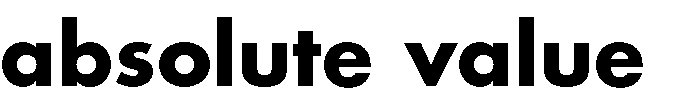
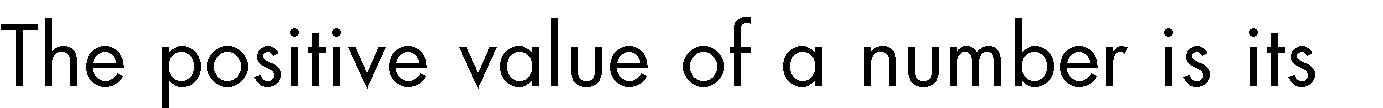
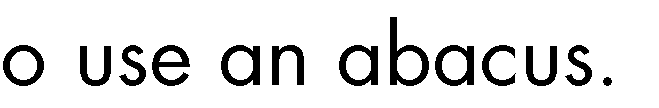
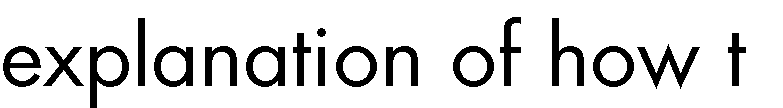
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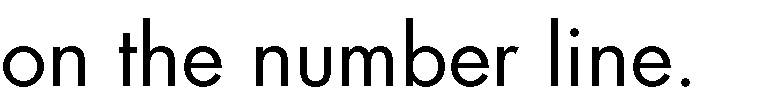


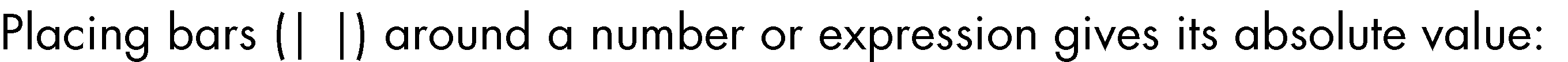
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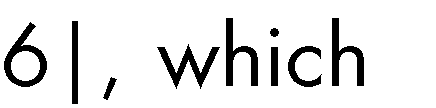
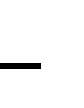
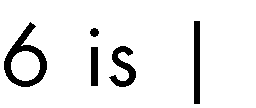
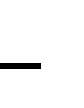
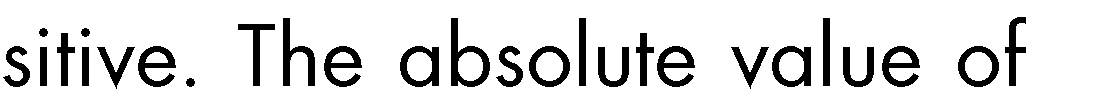
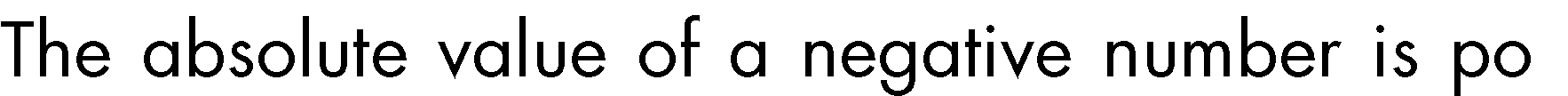
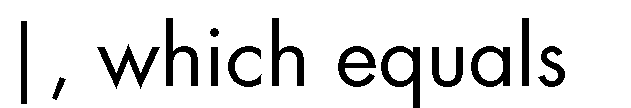
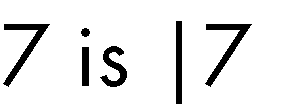
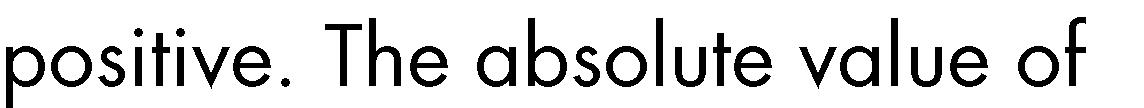
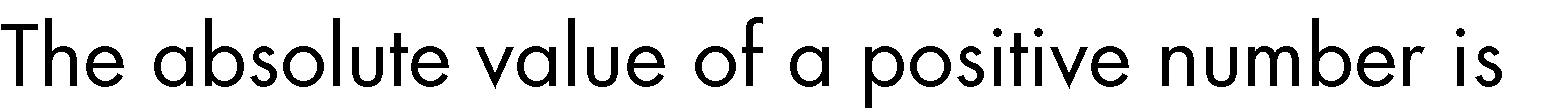
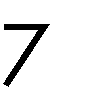
* + 1. Absolute value and negation



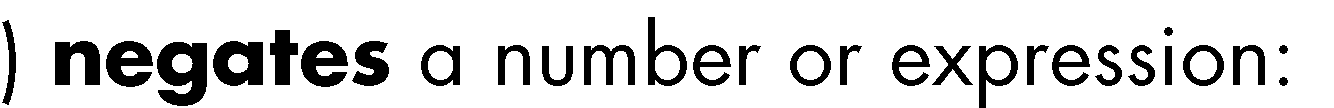
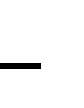
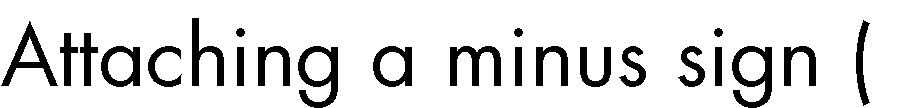
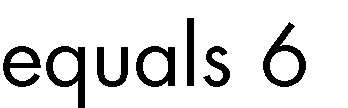




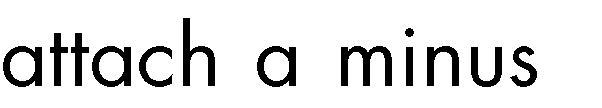
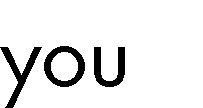
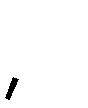
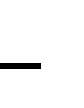
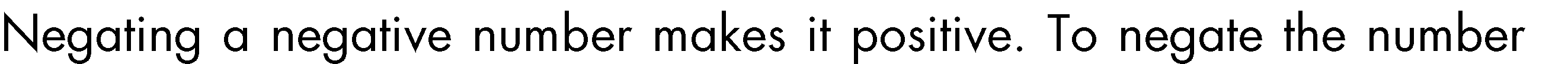
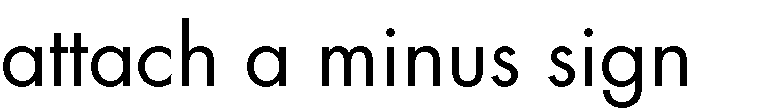
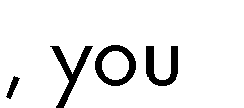
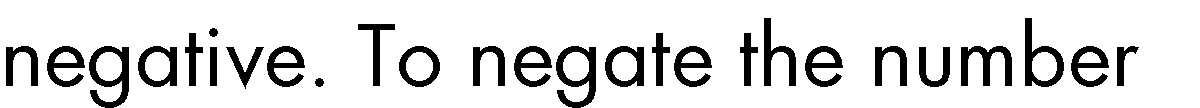
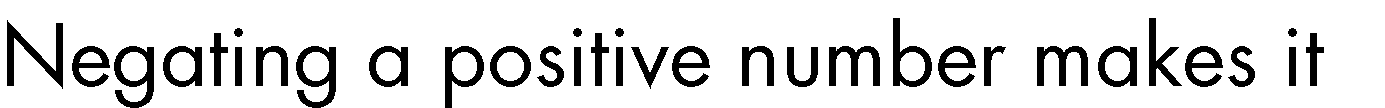
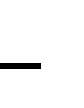
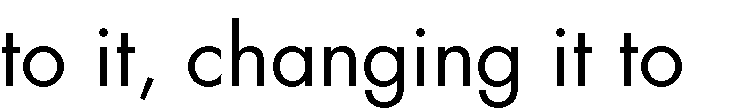
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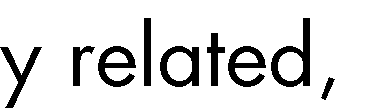
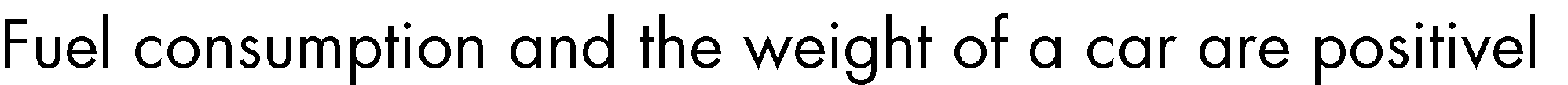
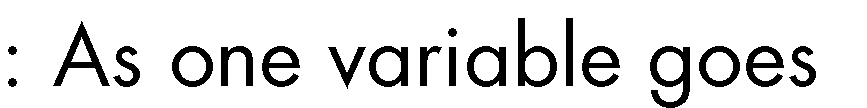
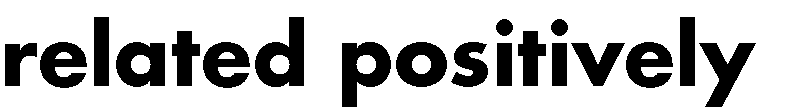
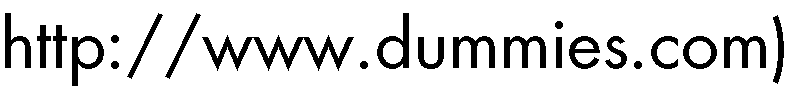
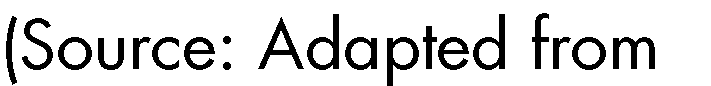
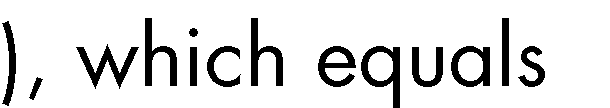
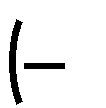
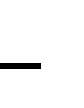
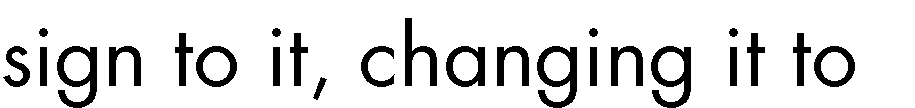
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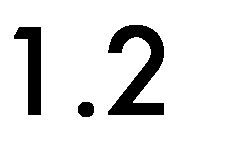
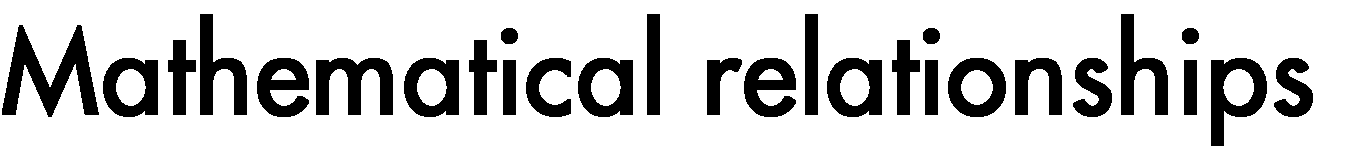


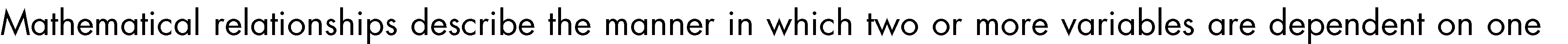
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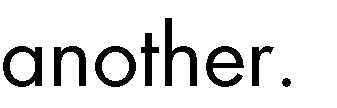


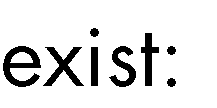
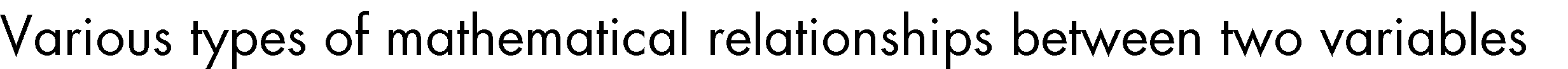
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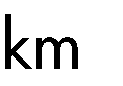
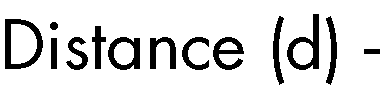
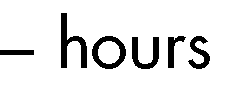
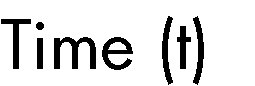
 





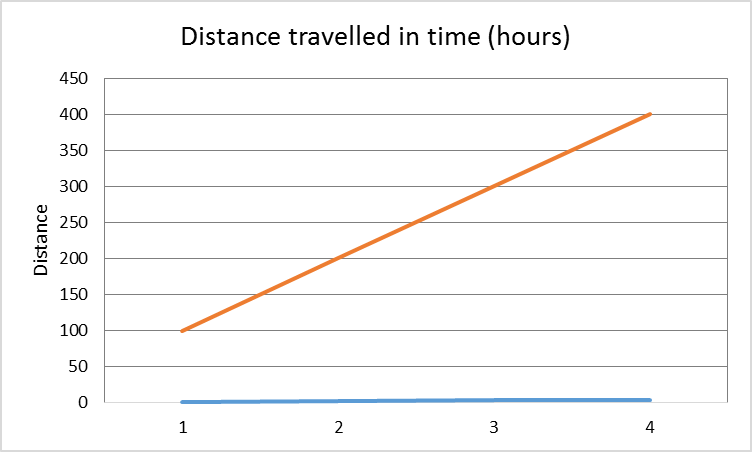
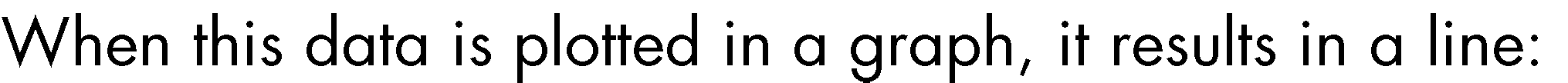
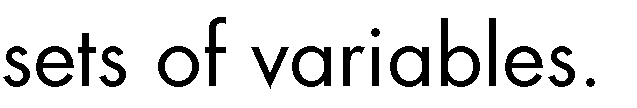
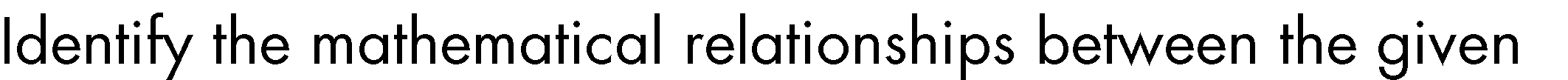
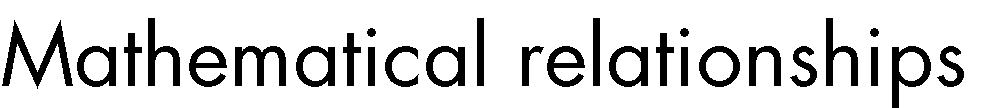
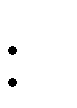
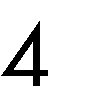
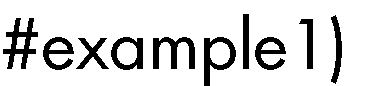
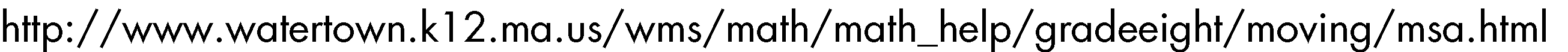
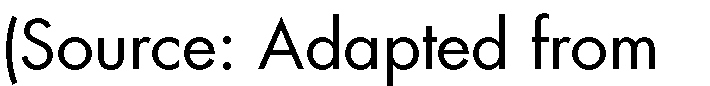


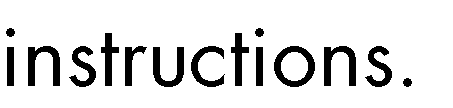
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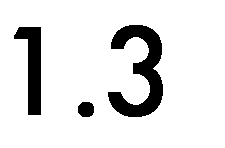
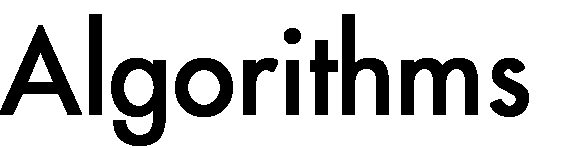


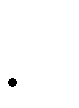
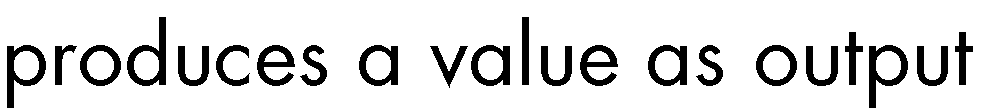
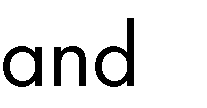
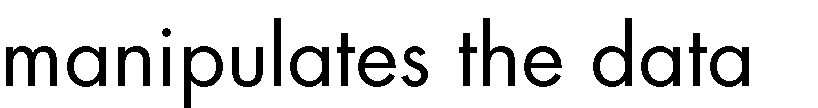
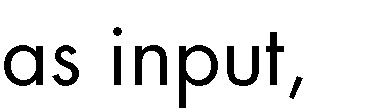
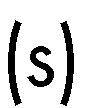
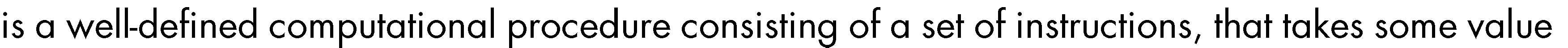
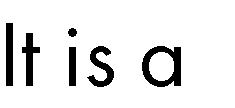
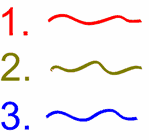
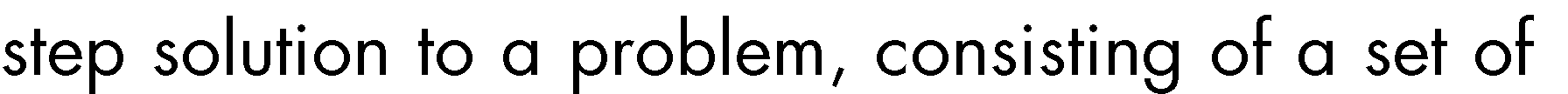
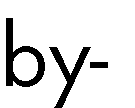
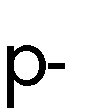
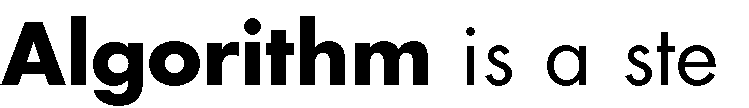
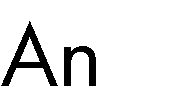
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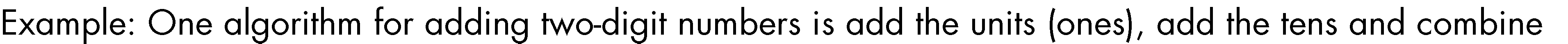
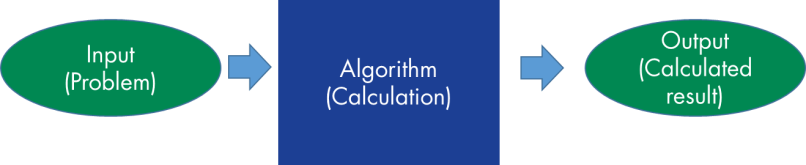
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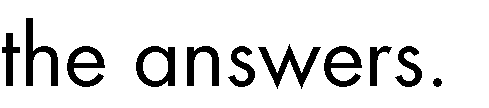




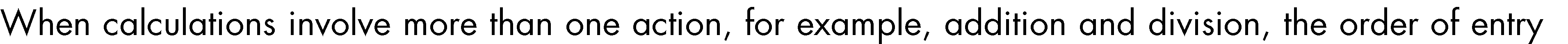
 

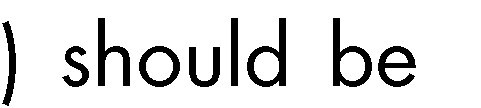
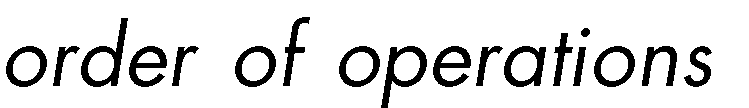
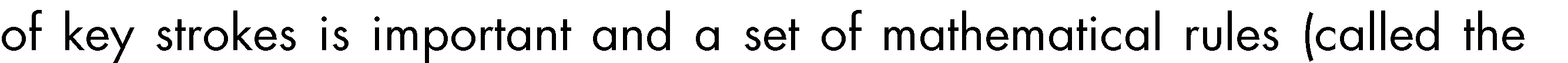


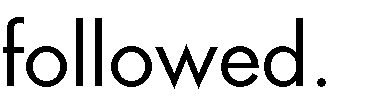


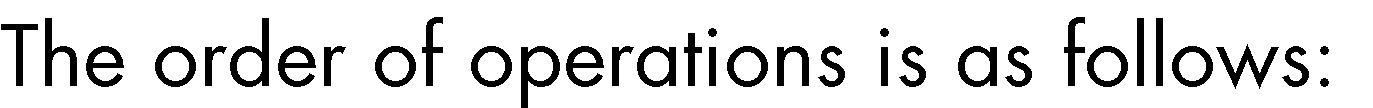


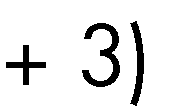
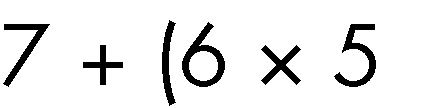
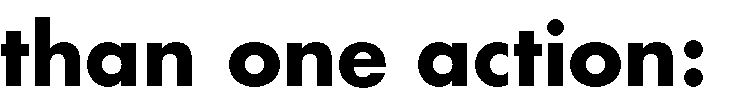
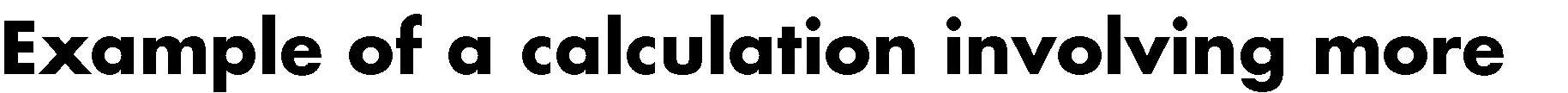
* + 1. The order of operations in calculations



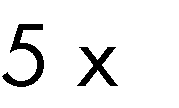
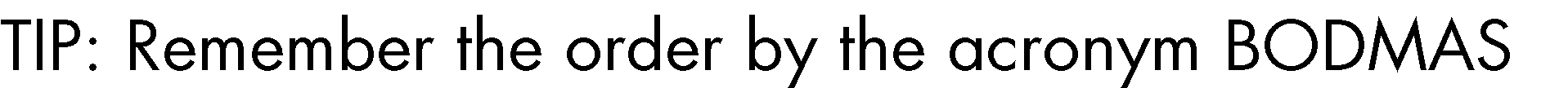






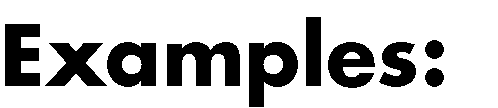


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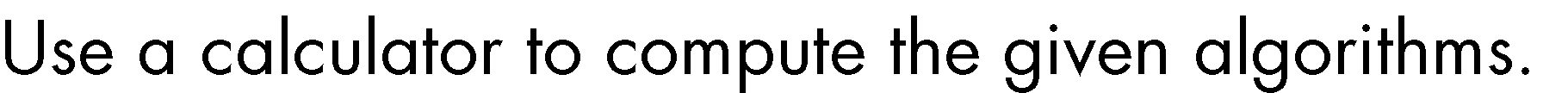


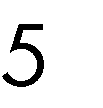


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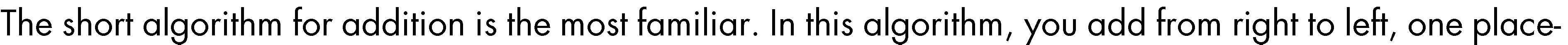
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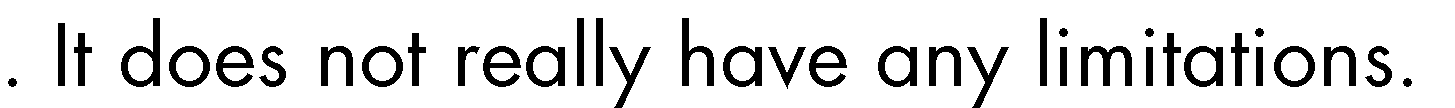
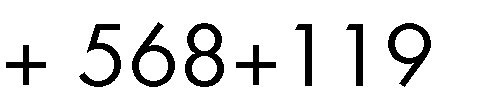
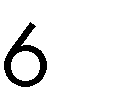
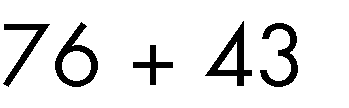
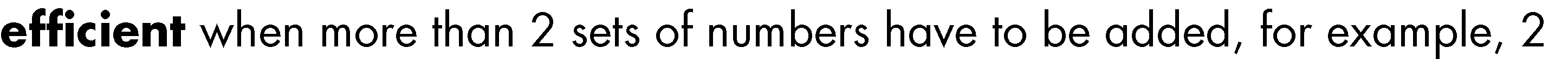
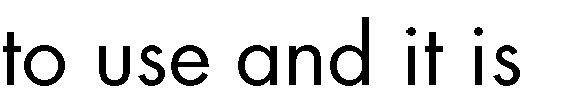
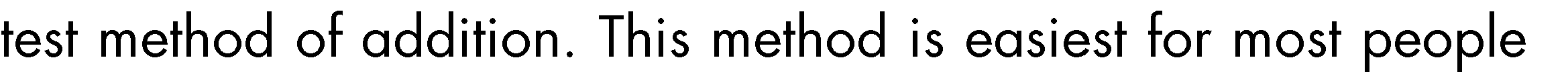
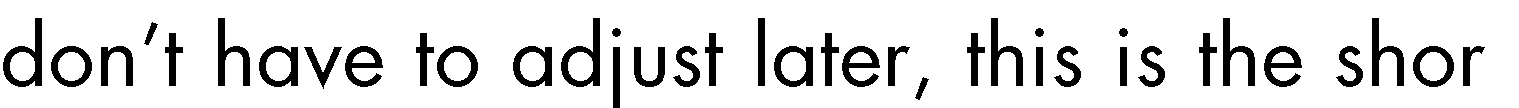
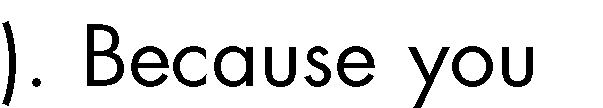
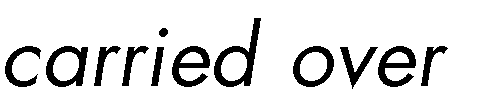
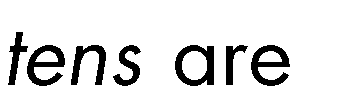
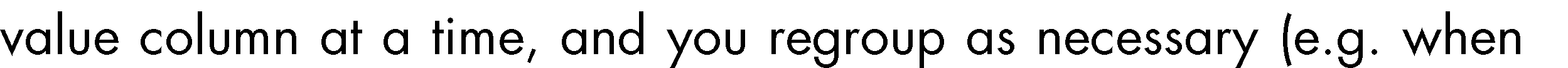


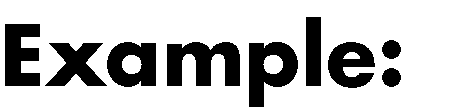
* + 1. Addition algorithms

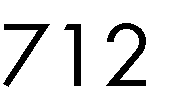
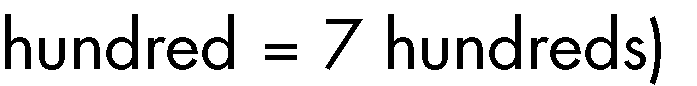
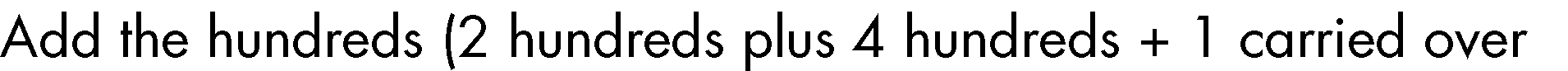
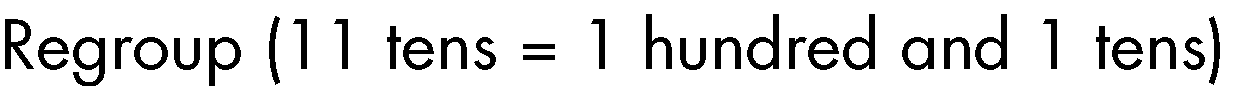
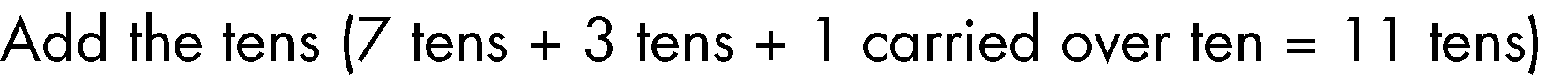
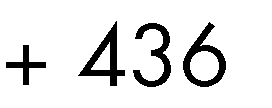
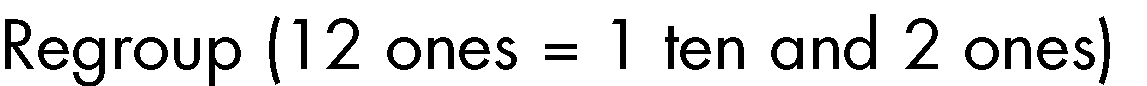
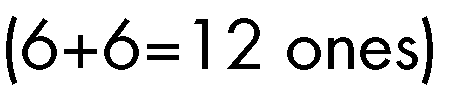
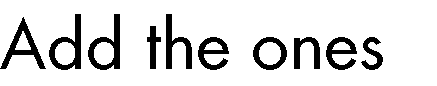
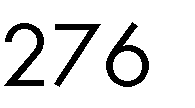
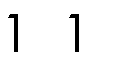


The short (standard) algorithm for addition

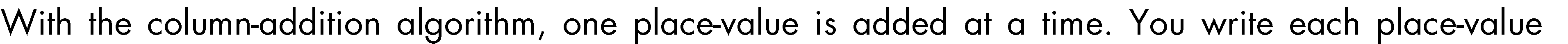


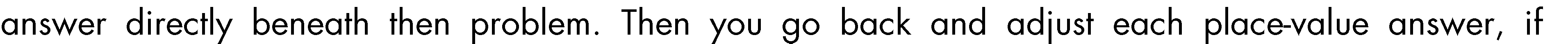


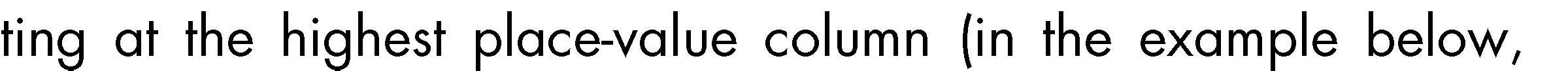
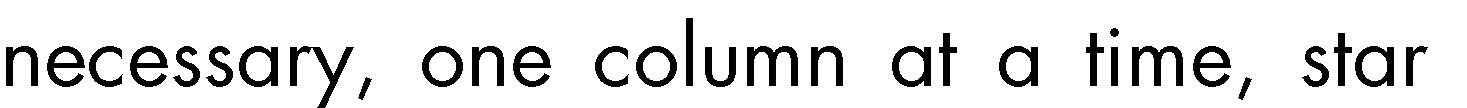


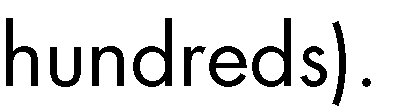


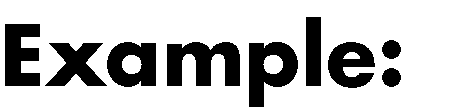
Column-addition algorithm





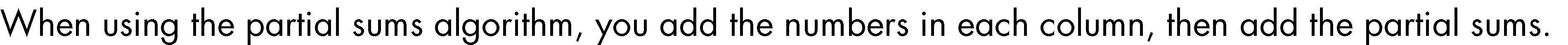


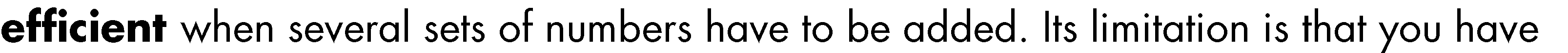
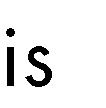
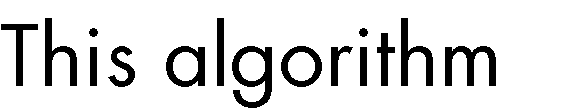
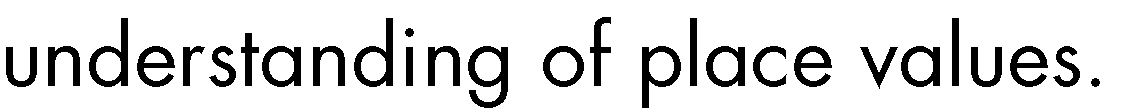
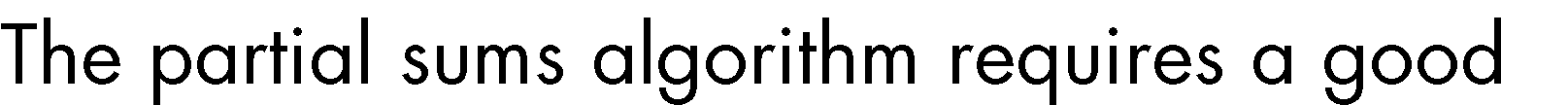


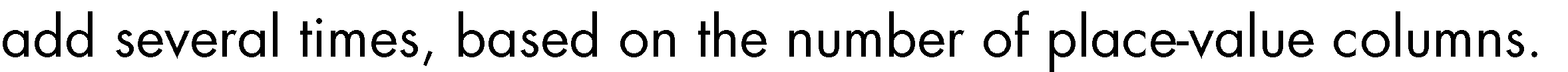


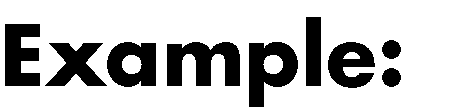
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Partial sums algorithm



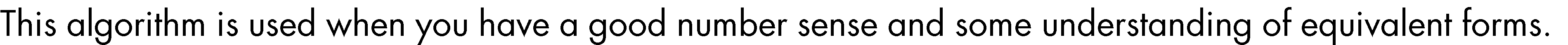


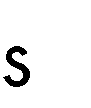
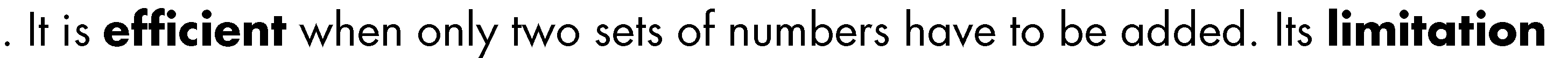
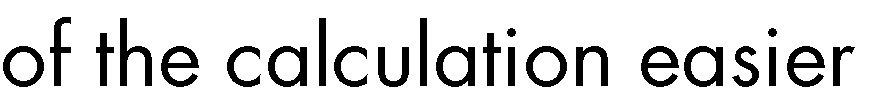
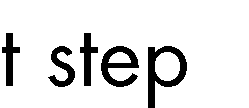
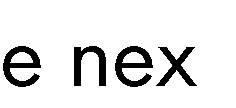
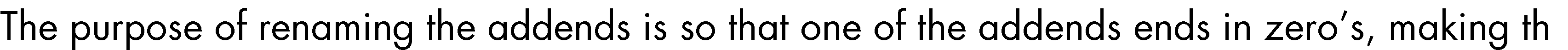
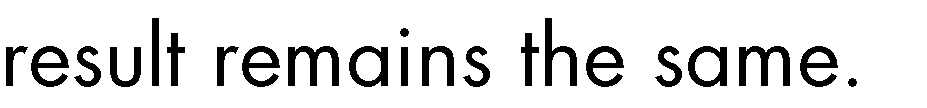
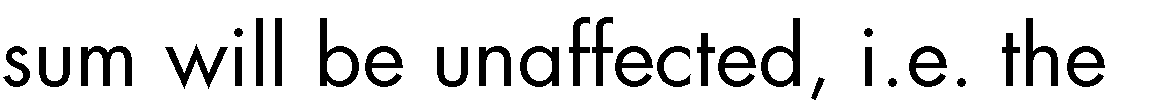
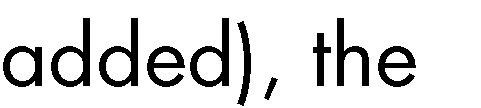
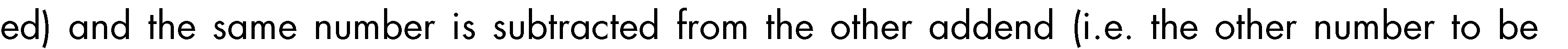
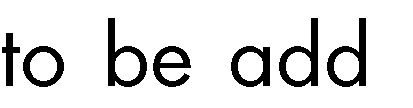
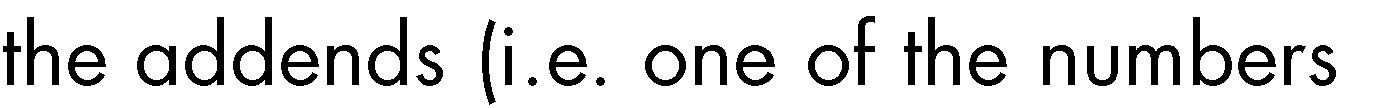
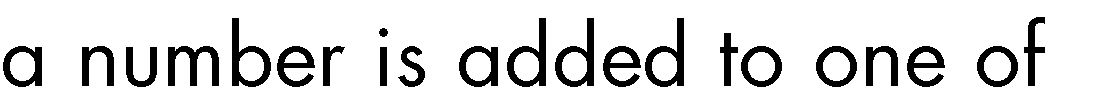
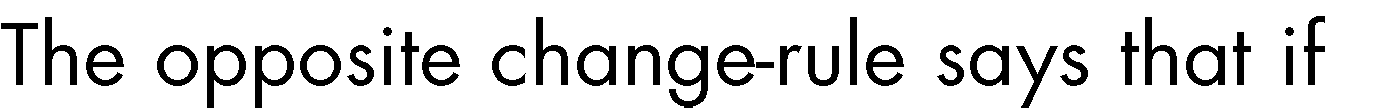


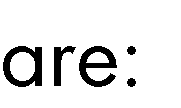


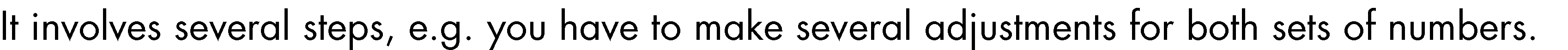
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Rename-Addends algorithm (also called the *opposite change* algorithm)

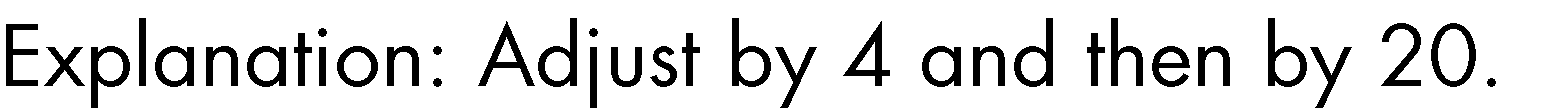
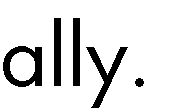
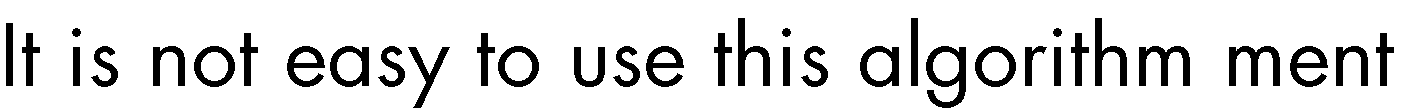


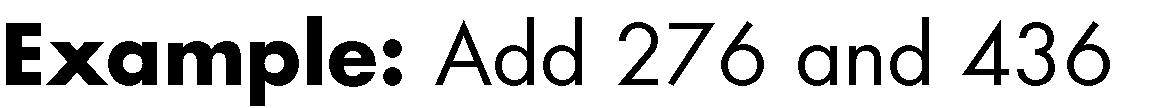




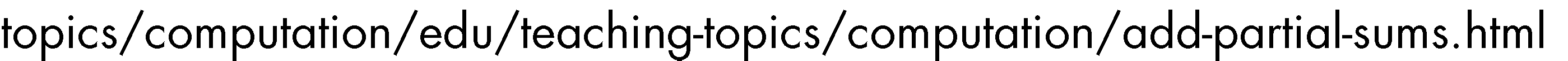
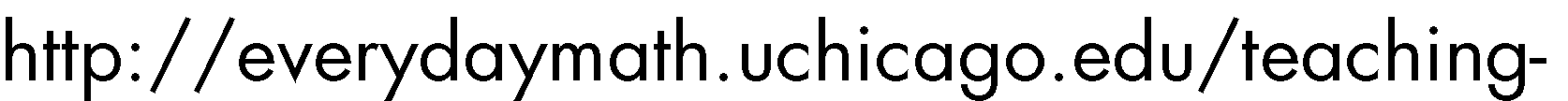
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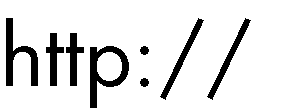
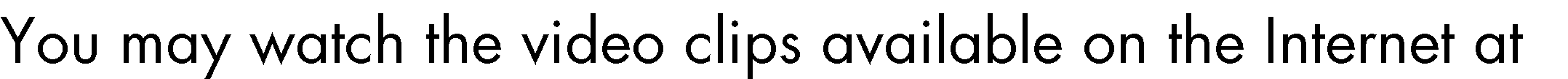
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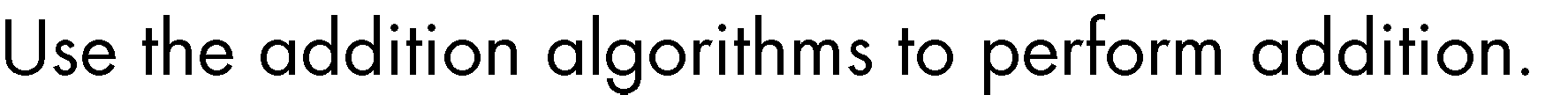


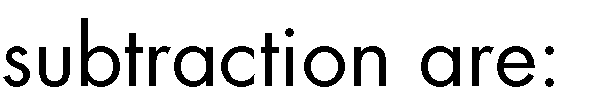
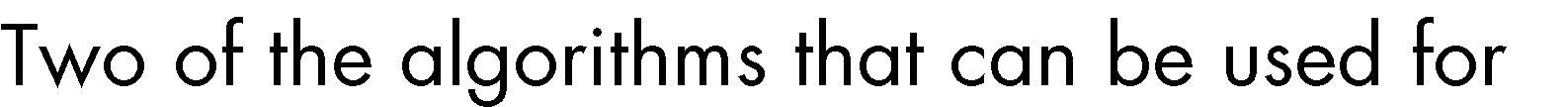
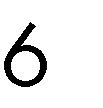


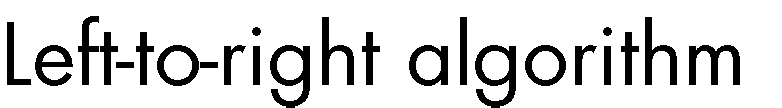
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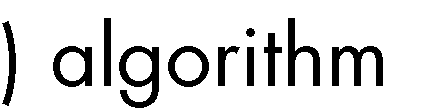
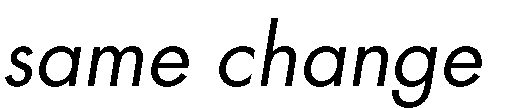
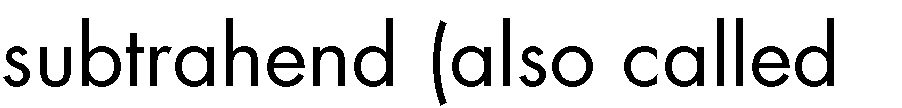
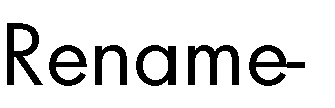


* + 1. Subtraction algorithms

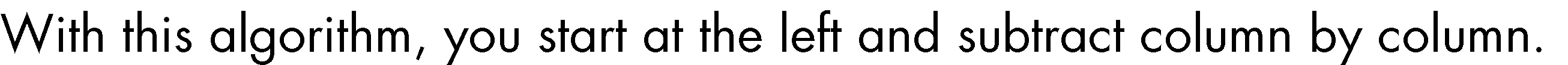


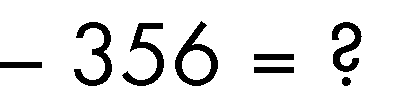
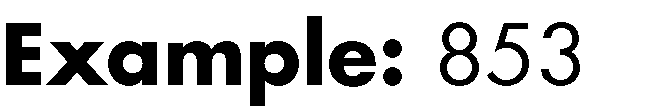
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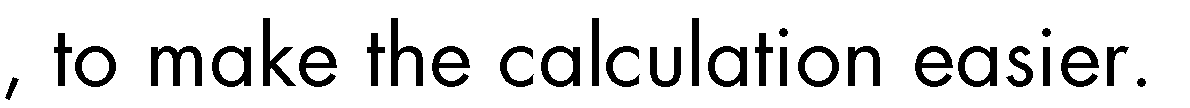
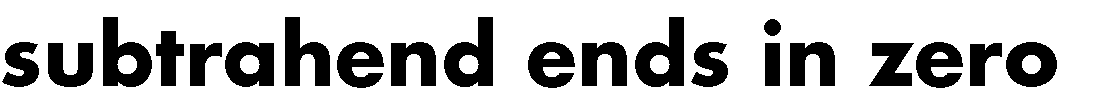
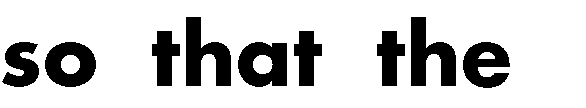
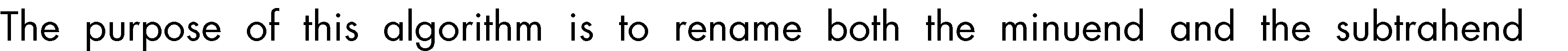
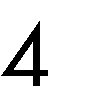
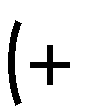
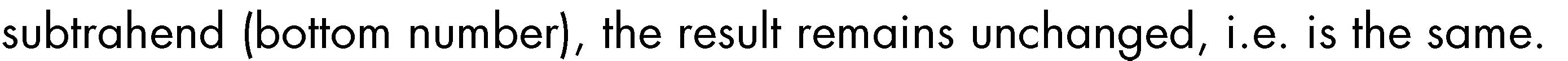
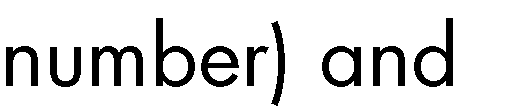
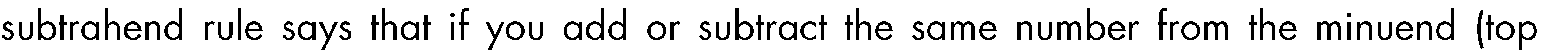
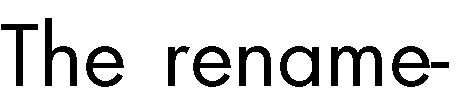
Left-to-right algorithm

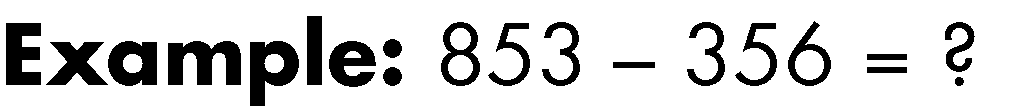


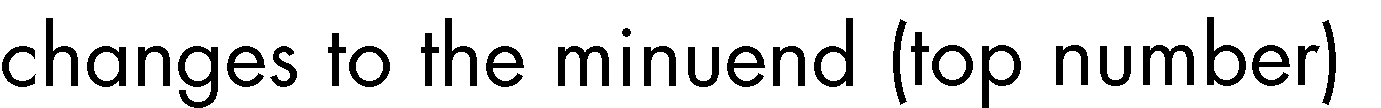
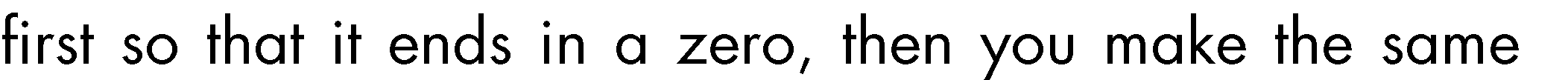
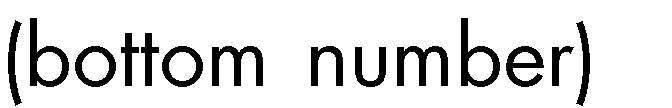
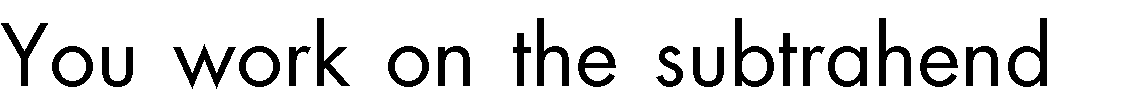
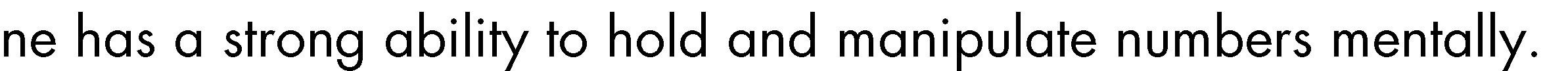
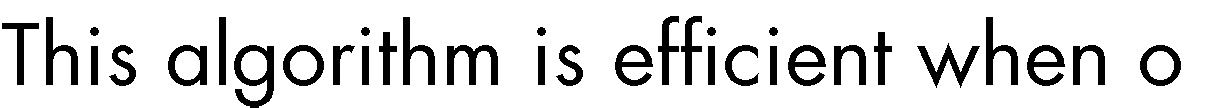


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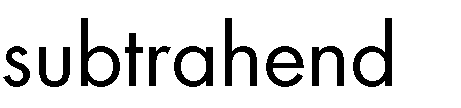
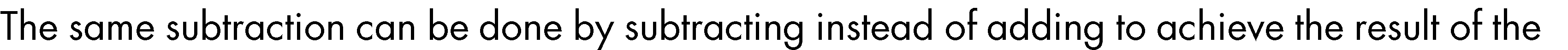
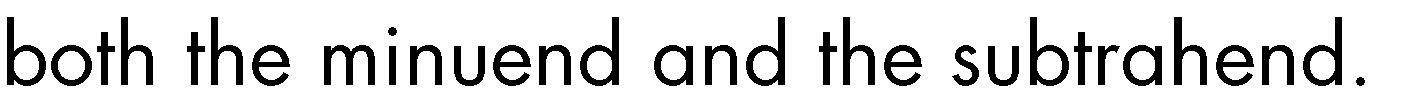
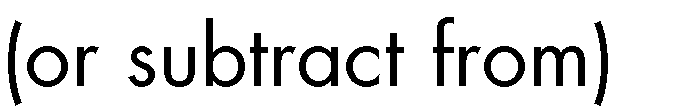
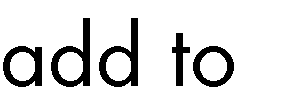
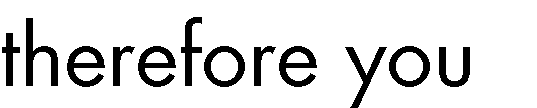
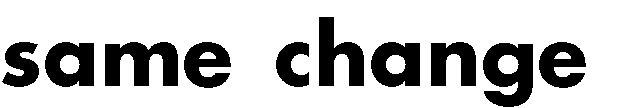
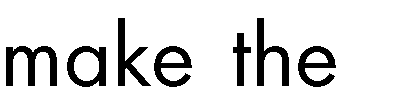
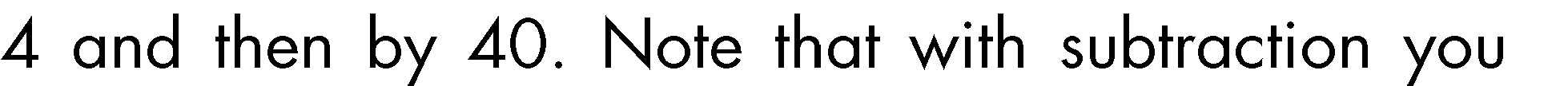
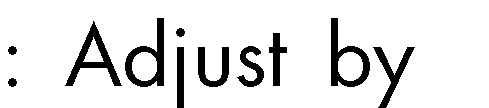
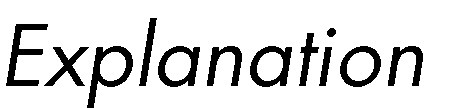
Rename-subtrahend algorithm (also called *same change* algorithm)

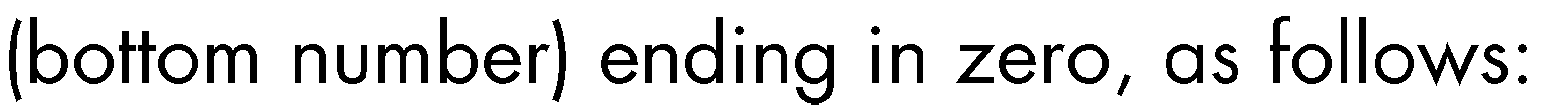




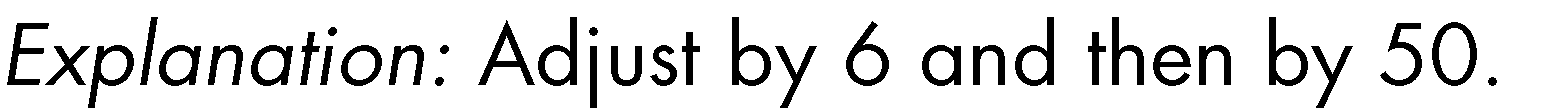


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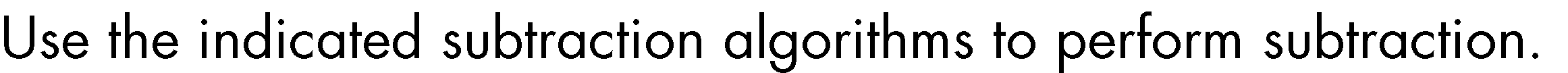


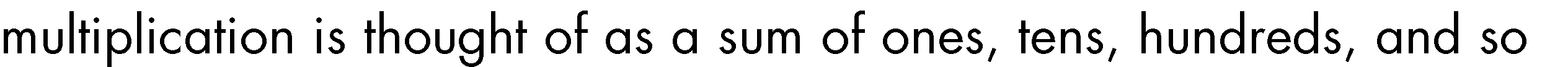
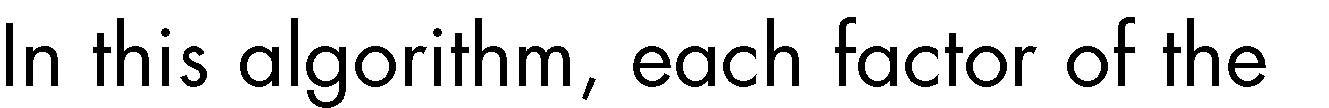
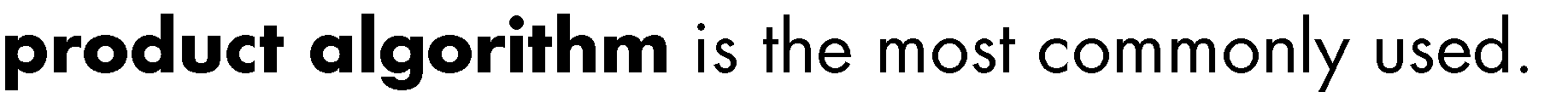
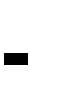
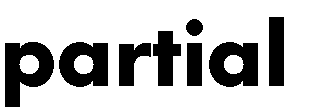
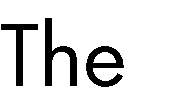
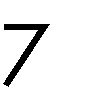


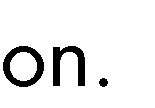
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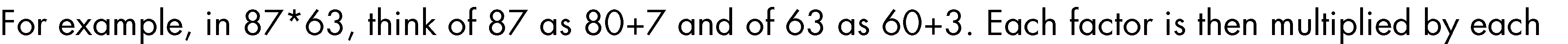


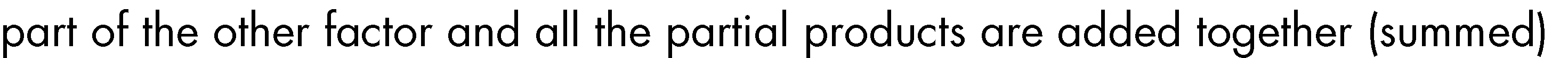


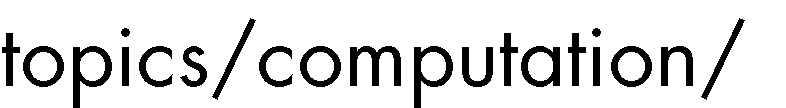
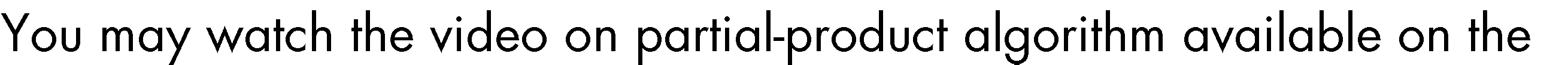
* + 1. Multiplication algorithms

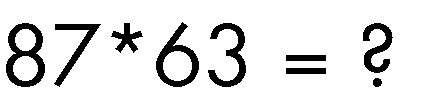
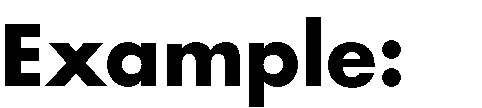
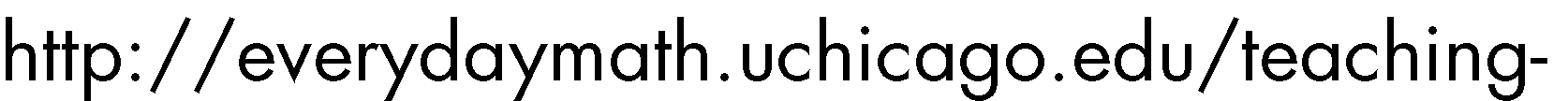
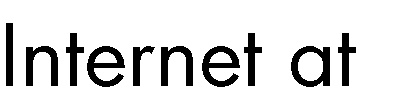


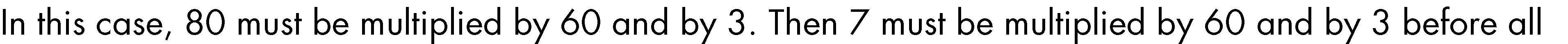


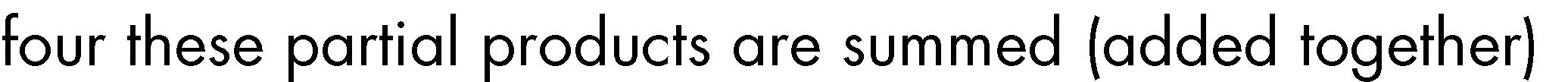






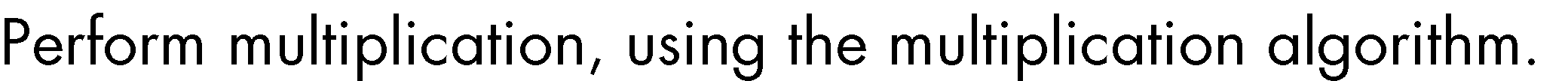


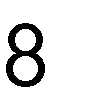




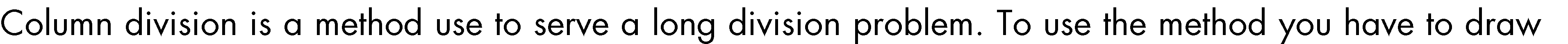
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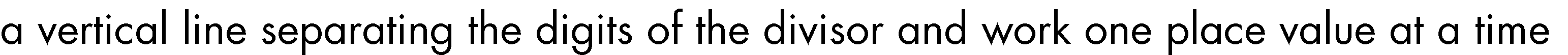


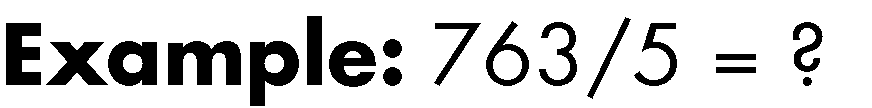
* + 1. Division algorithms

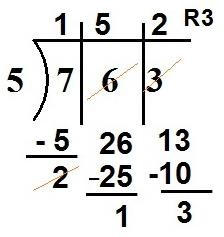


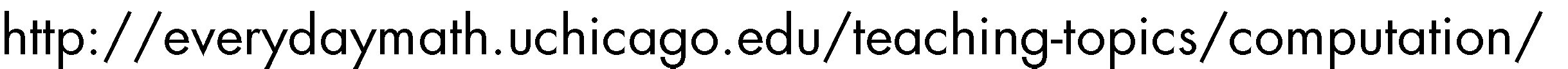
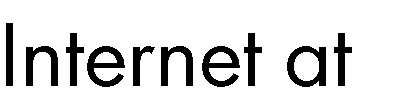
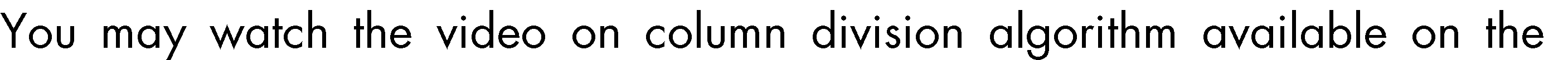
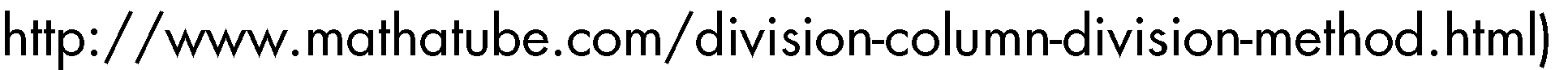
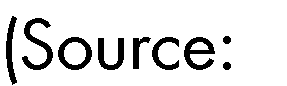
Column division (also called the *standard division algorithm*)



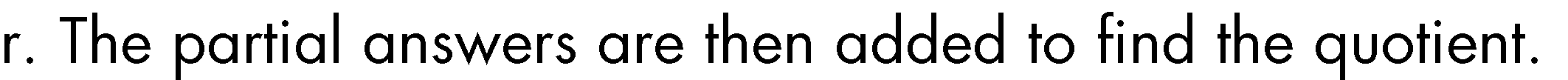
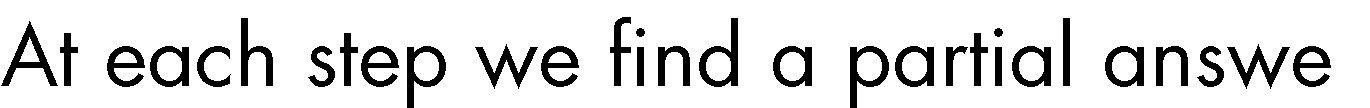
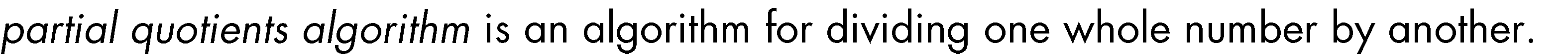
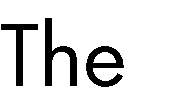




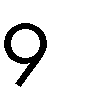
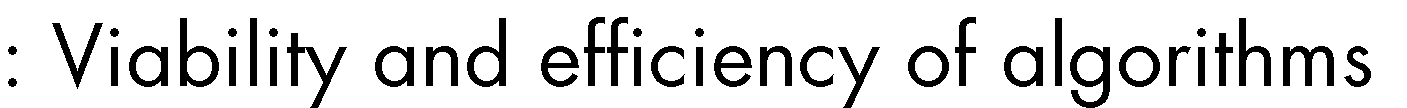
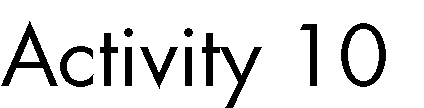


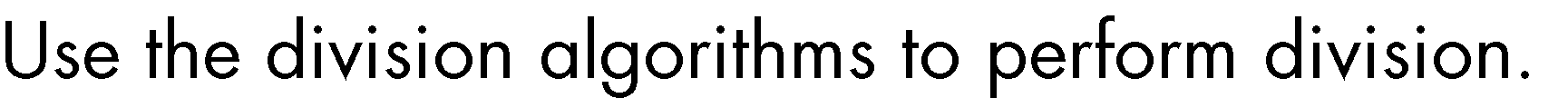


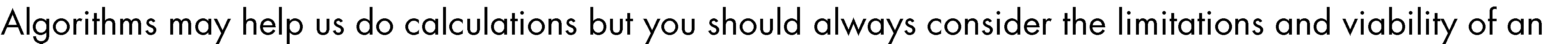
Partial quotients algorithm (also called the *scaffold algorithm*)

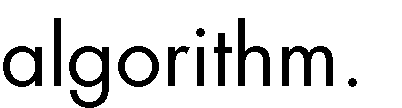


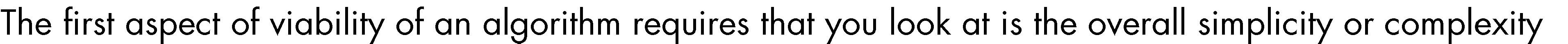
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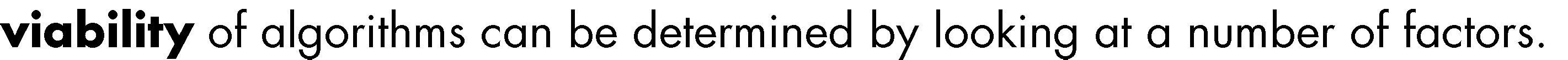
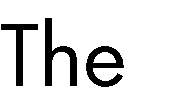


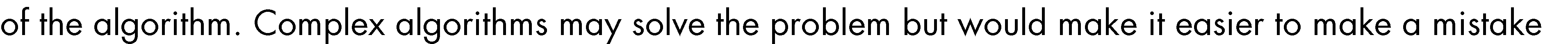
* + 1. The roles and limitations of algorithms

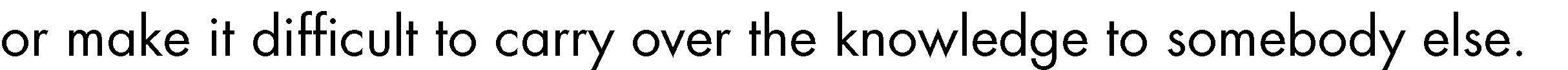


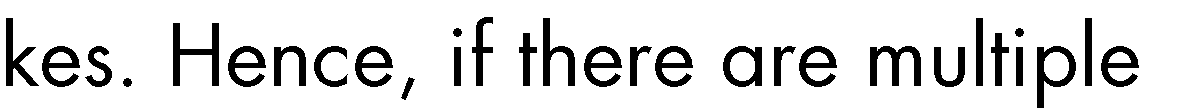
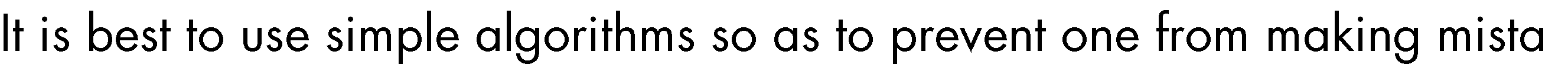


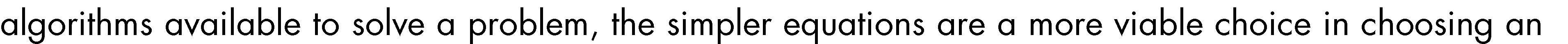


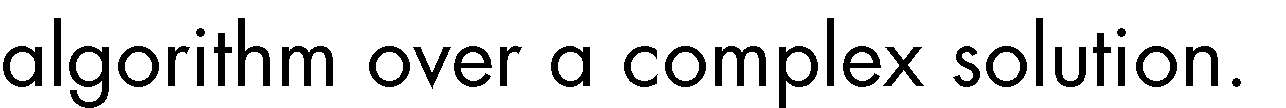


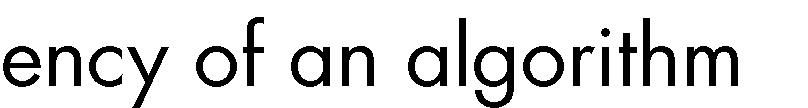
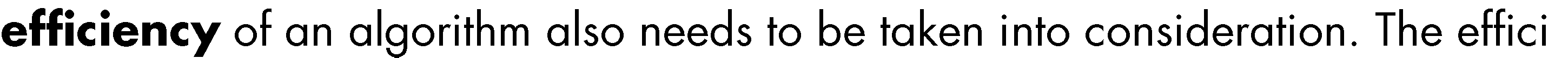
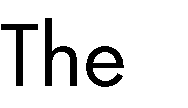


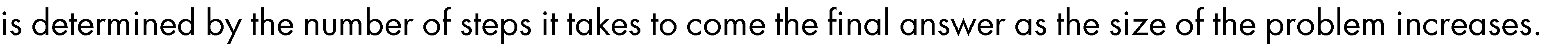


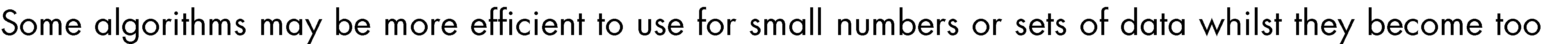


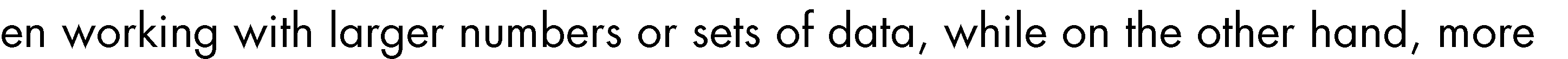
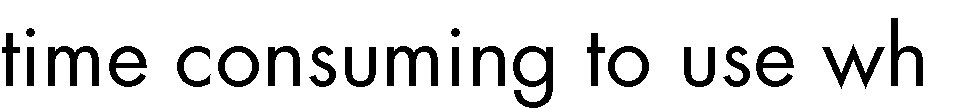


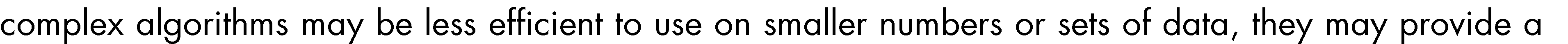


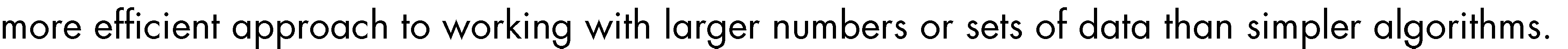




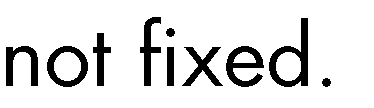


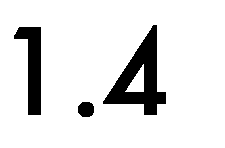


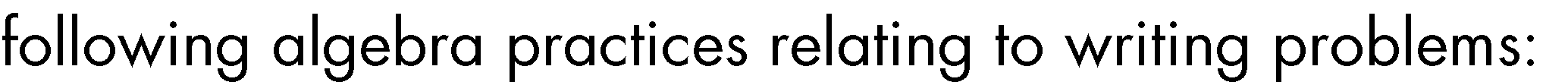
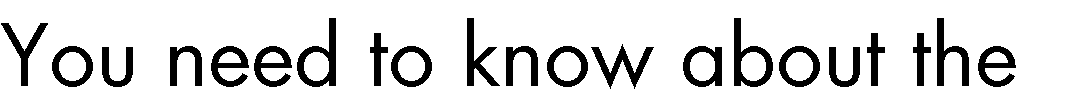
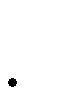
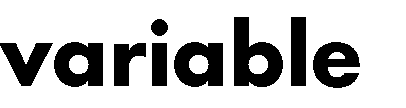
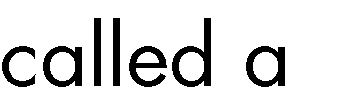
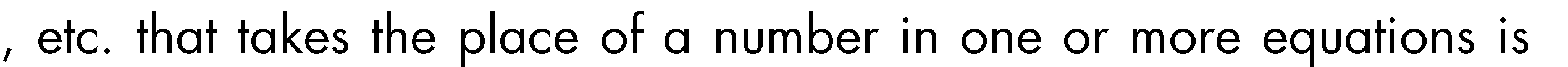
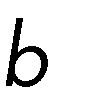
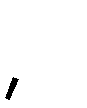
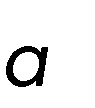
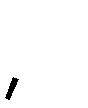
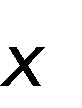
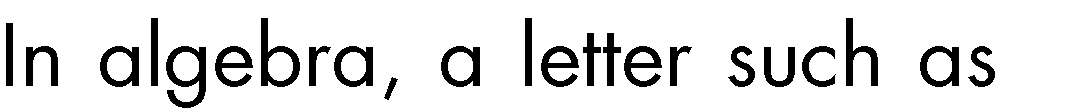


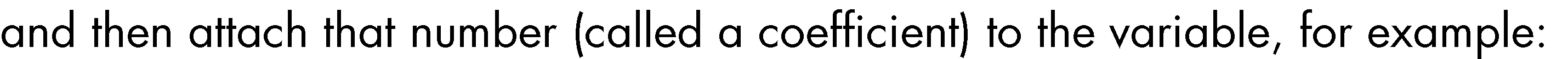


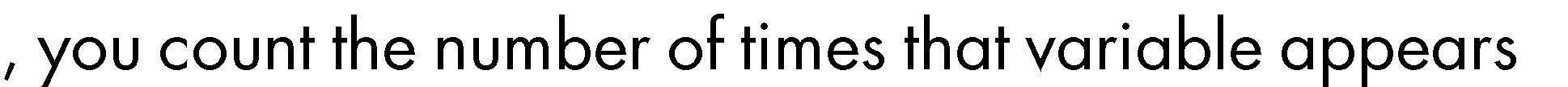
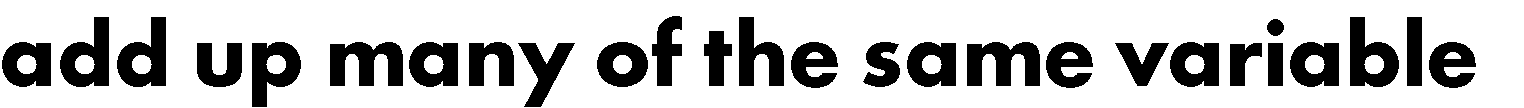
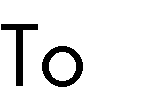




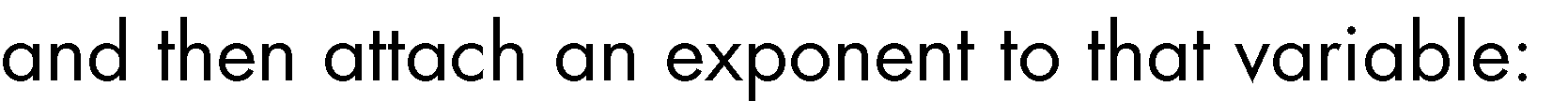
 

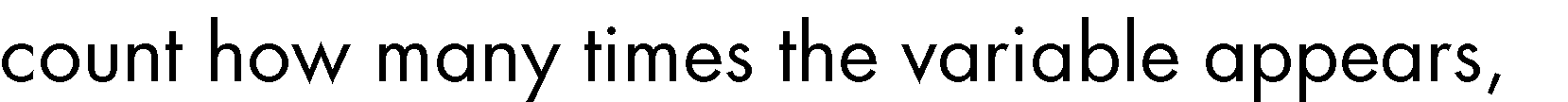
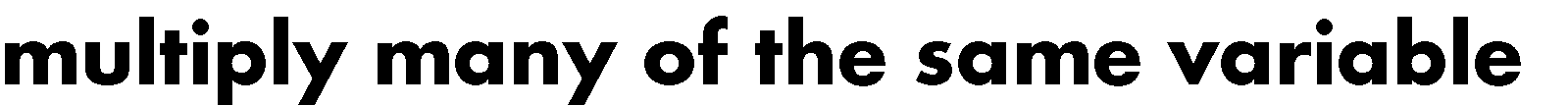
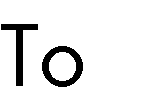






*x* + *x* + *x* + *x* = 4*x*

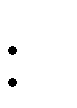
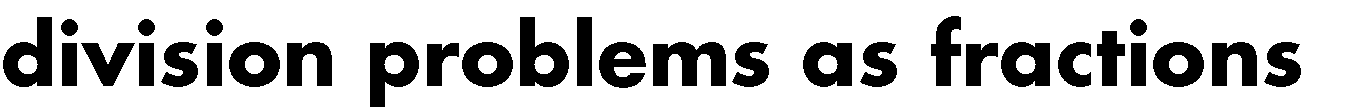
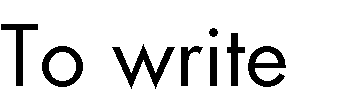
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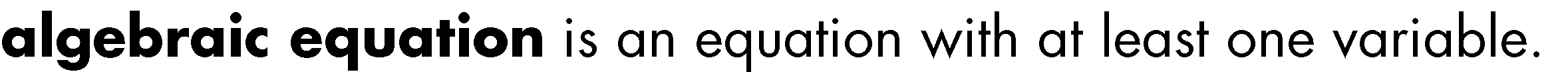
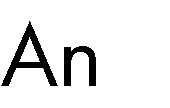
*X* \* *x* = *x*2

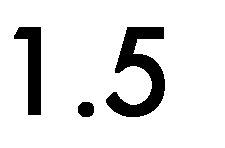
*x* \* *x* \* *x* \* *x* \* *x* = *x*5

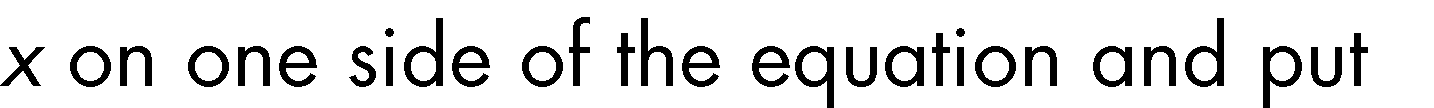
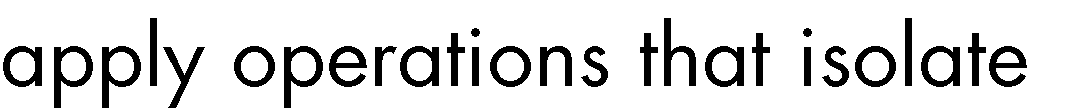
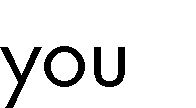
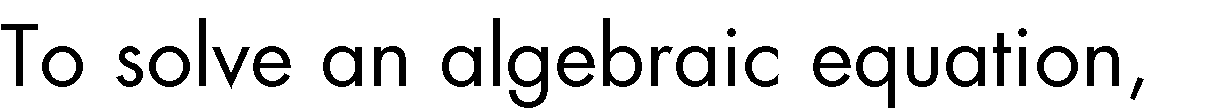
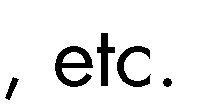
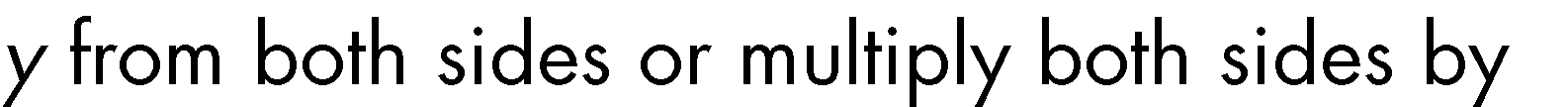
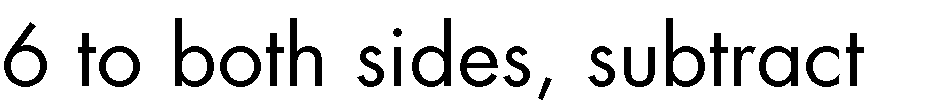
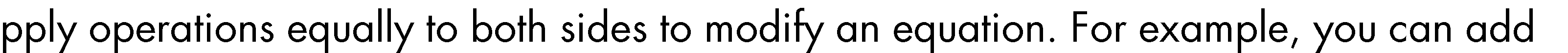
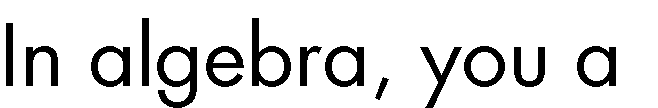
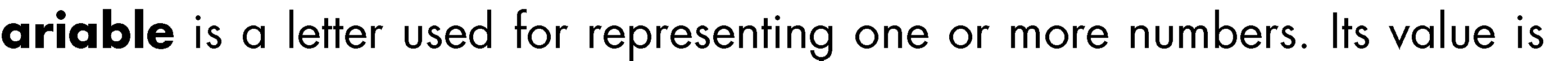
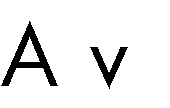
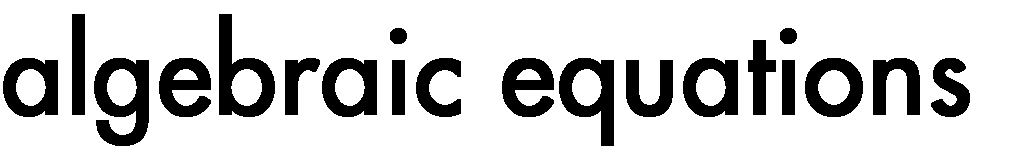
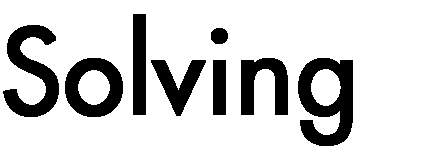
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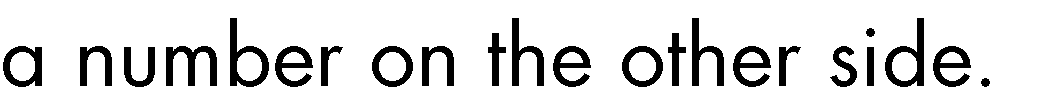


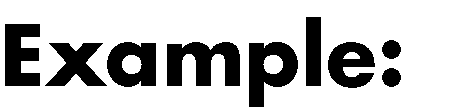
*x ÷ 4 is written as x/4 x ÷ 10 = x/10*



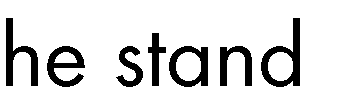
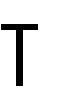


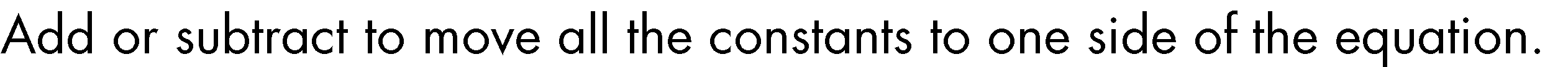


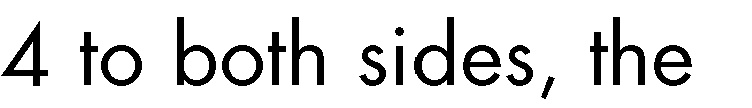




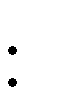
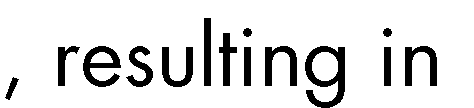
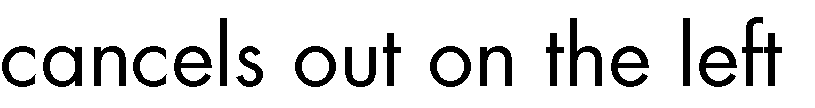
10*x* – 4 = 7*x* + 9:







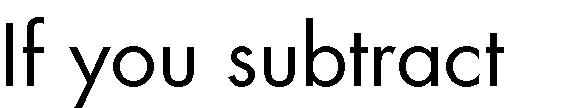
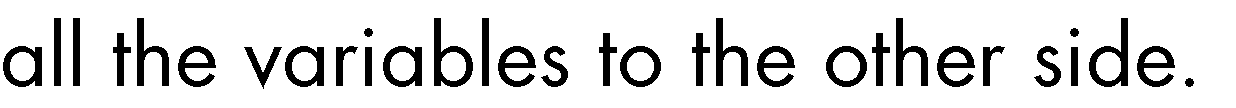
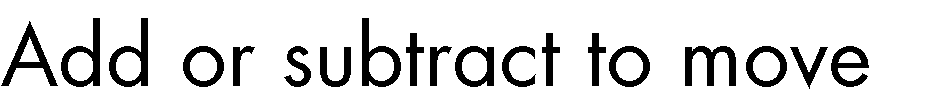
–4



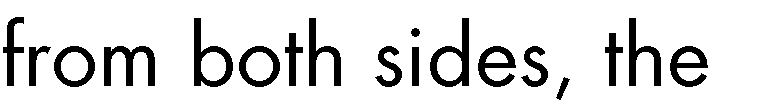
10*x* = 7*x* + (9+4)

= 7x + 13

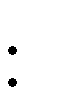
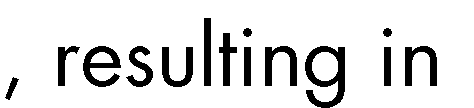
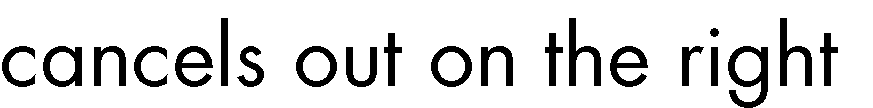




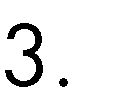
7*x*

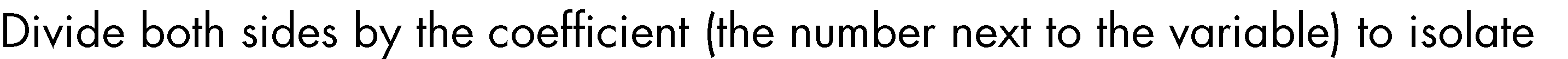


7*x*

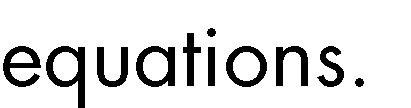
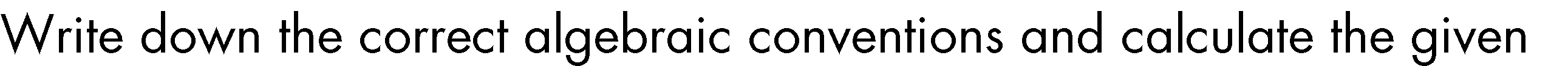


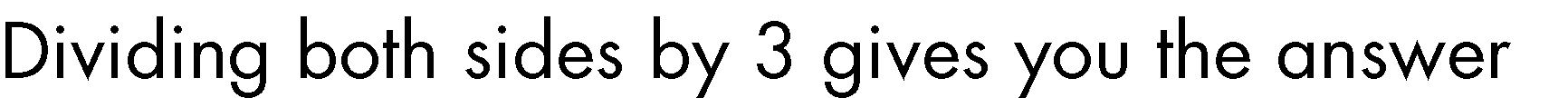
3*x* = 13



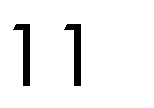


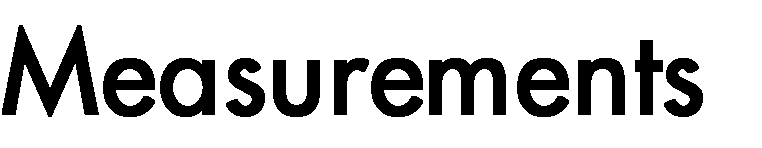
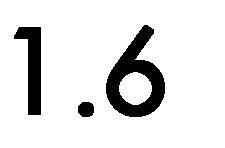
*x*

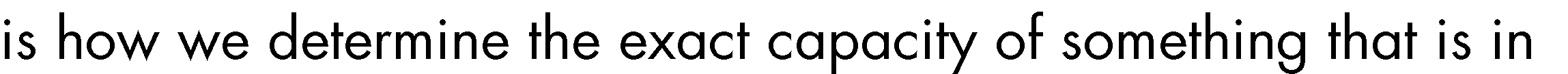
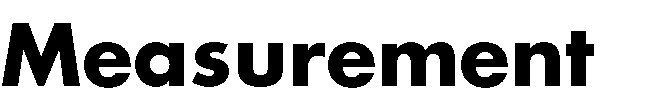
= 4.33333

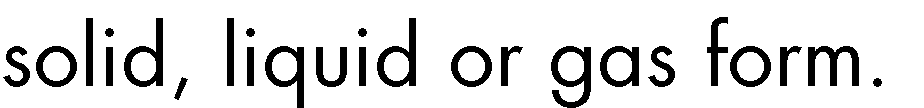


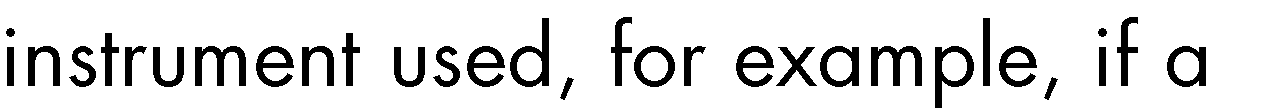
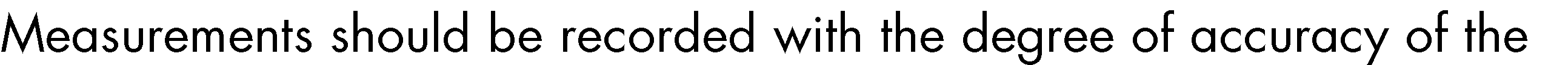
*x*

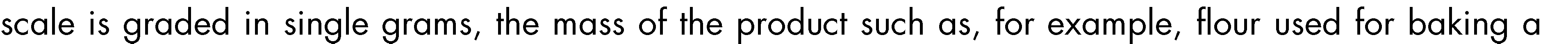


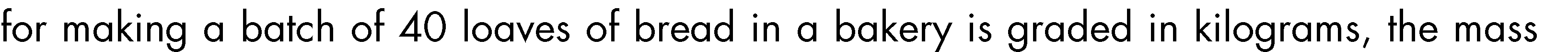
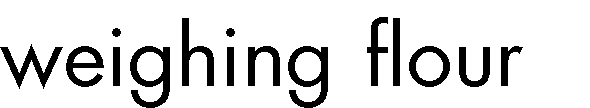
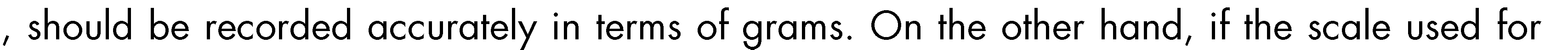
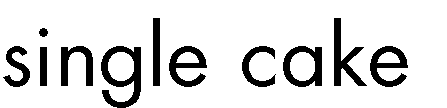




* + 1. Recording measurements in accordance with the degree of accuracy of the instrument used





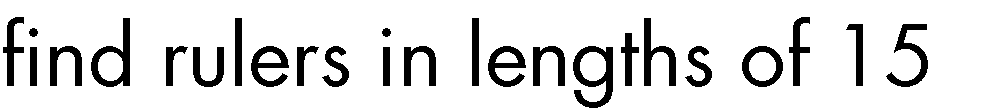
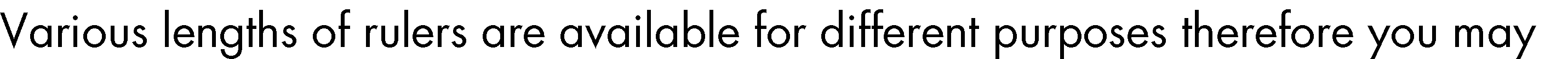
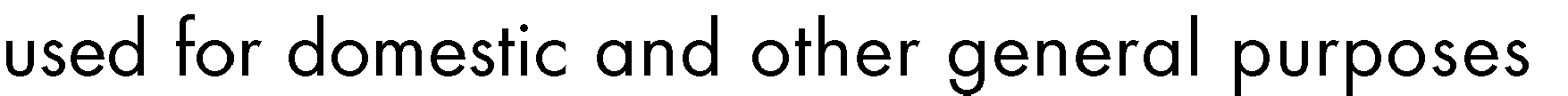
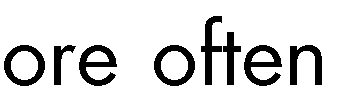
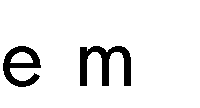
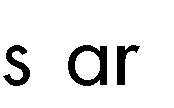
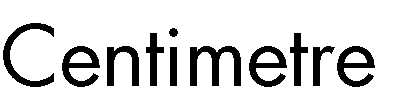
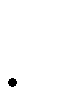
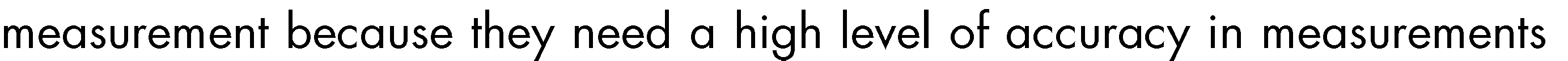
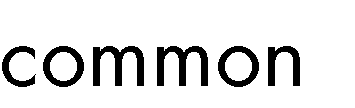
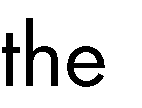
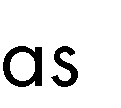
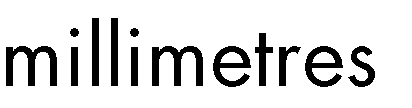
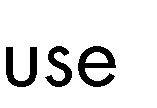
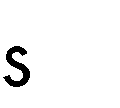
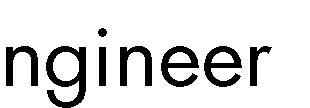
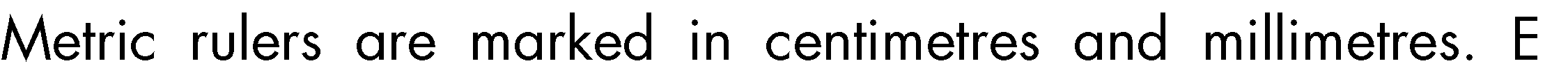


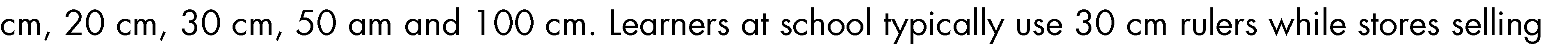


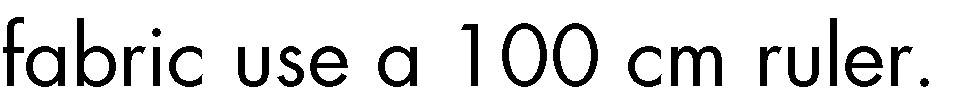
* + 1. Instruments used for measurement

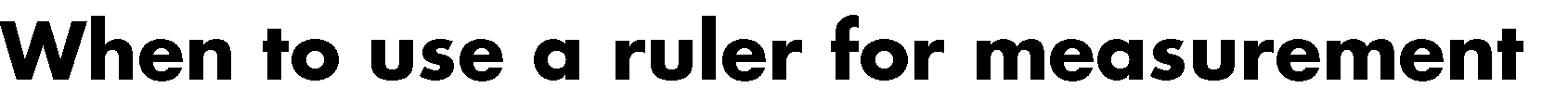
Ruler

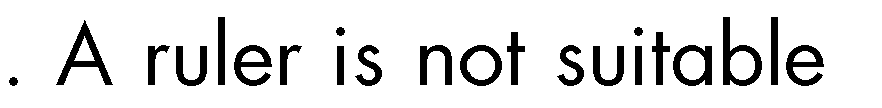
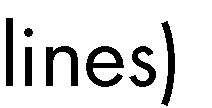
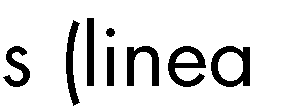
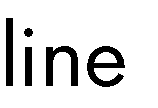
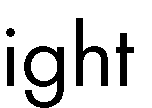
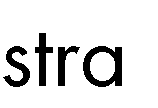
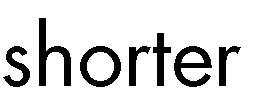
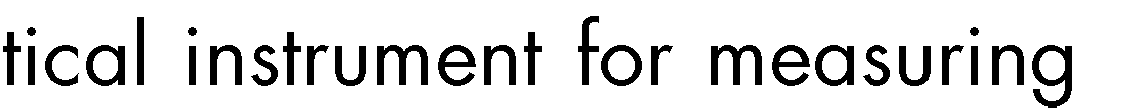
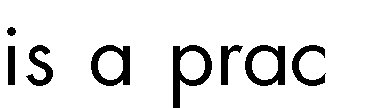
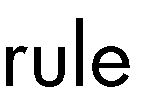
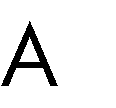


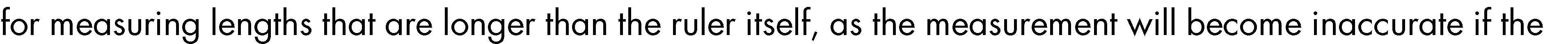


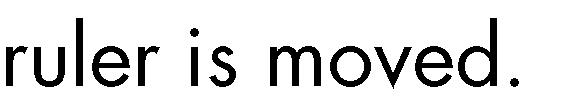


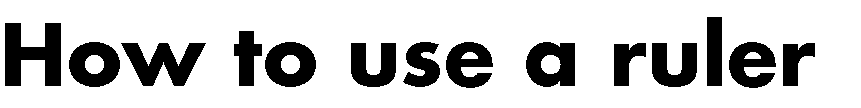


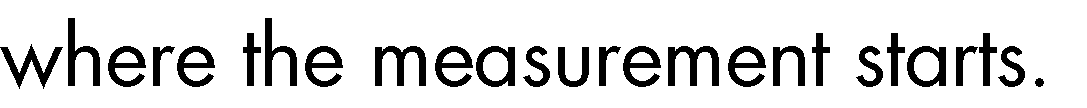


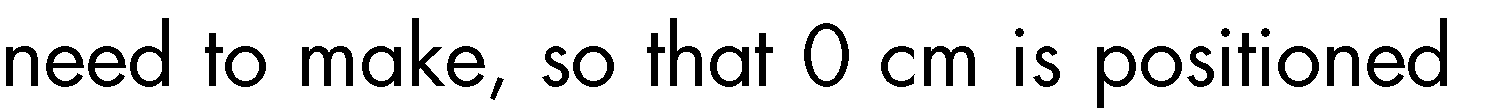
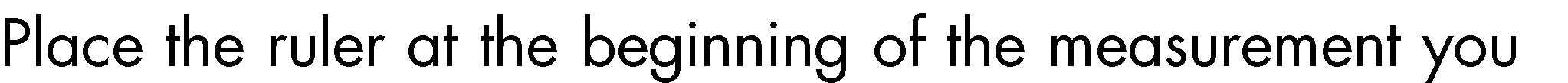




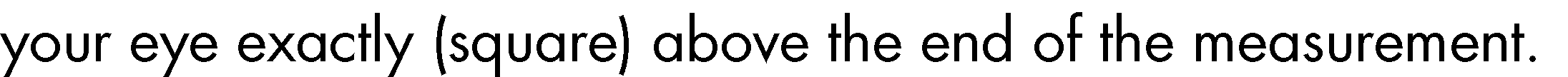
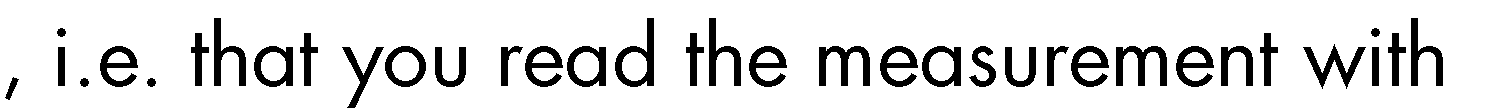
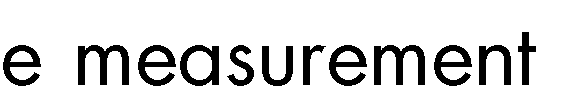
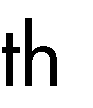
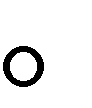
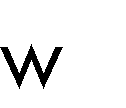
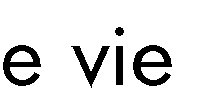
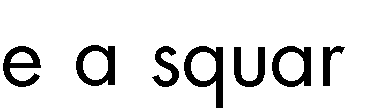
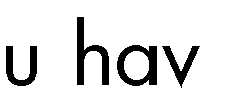
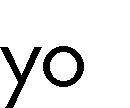
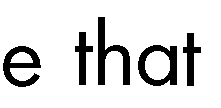
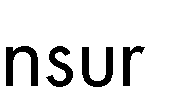
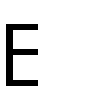


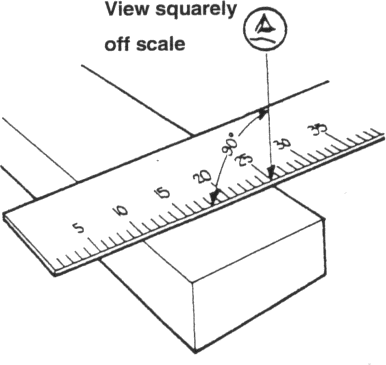


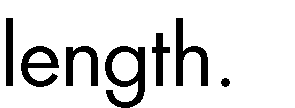
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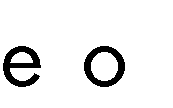
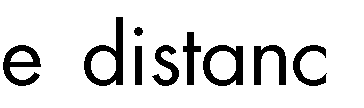
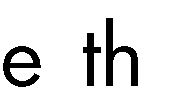
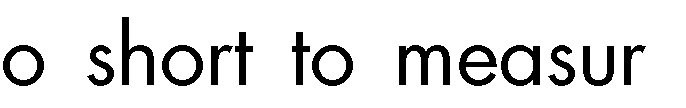
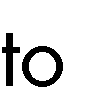
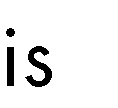
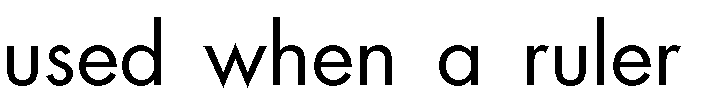
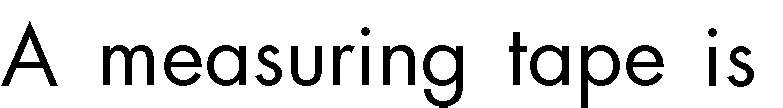


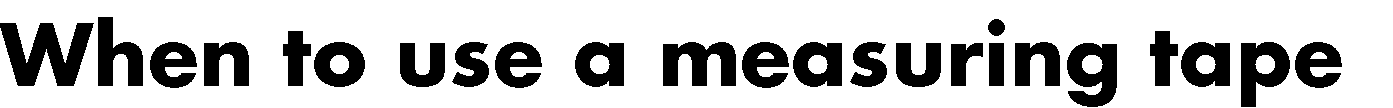
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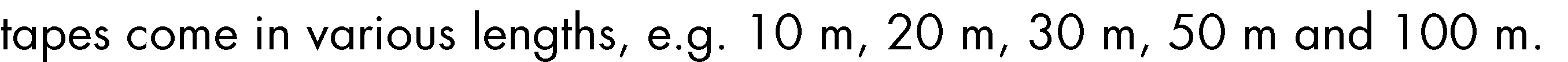
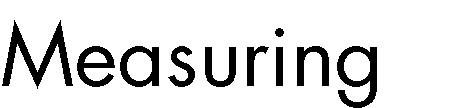


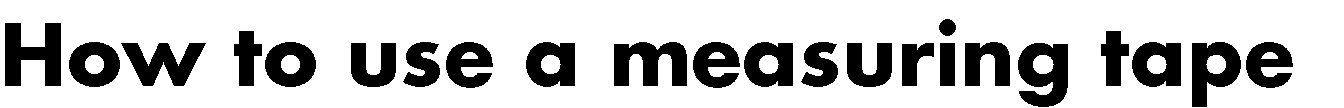


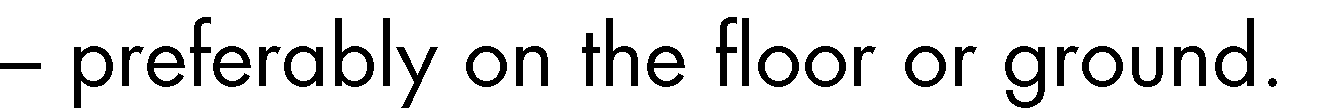
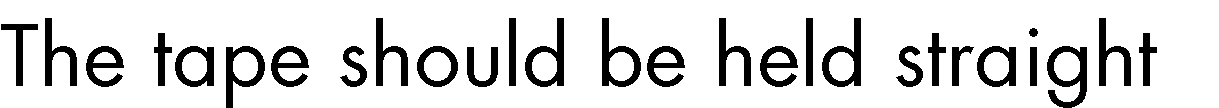
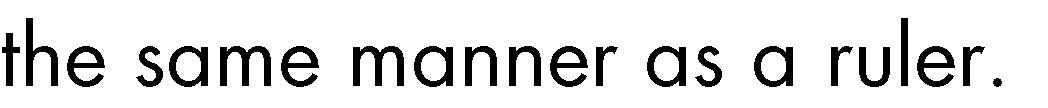
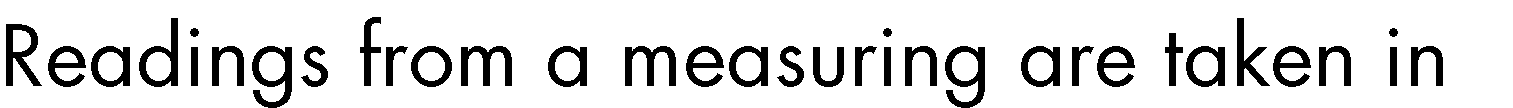
Measuring tapes

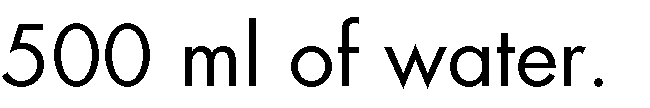


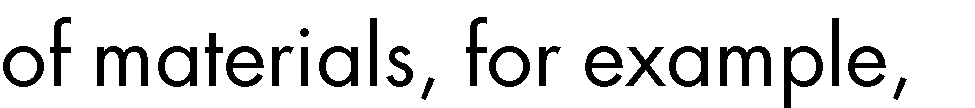
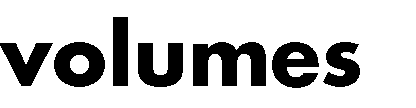
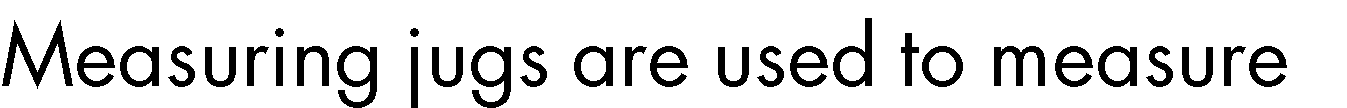


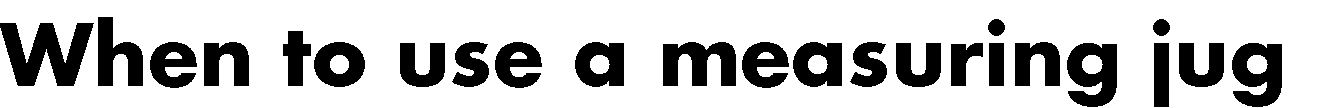


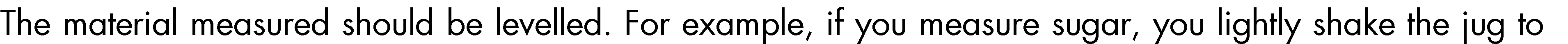


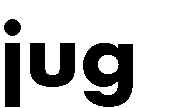
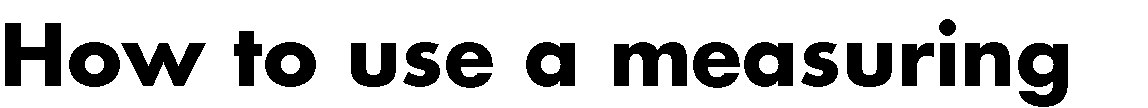


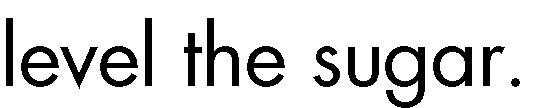
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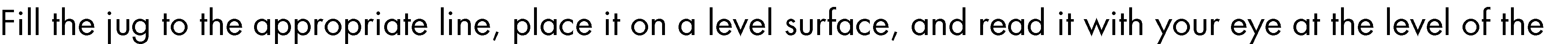


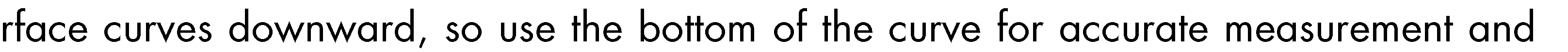
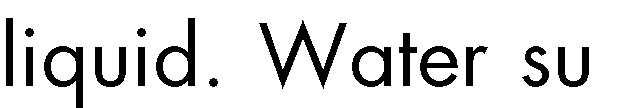


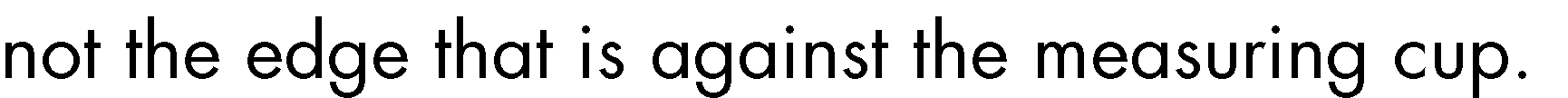






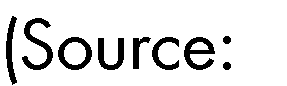


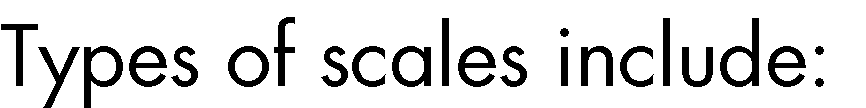


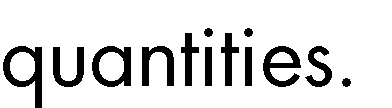
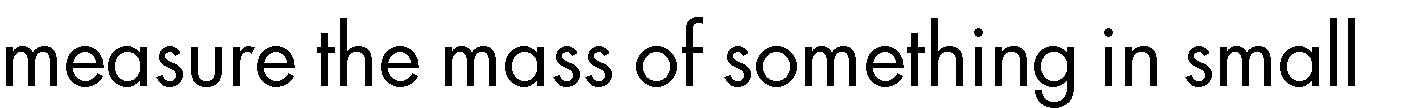
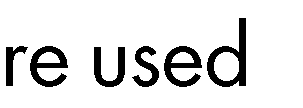
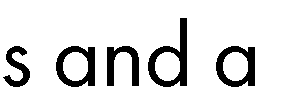
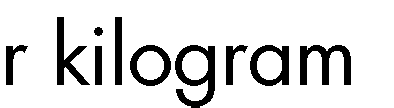
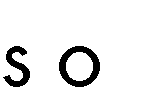
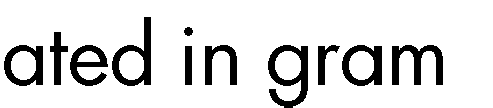
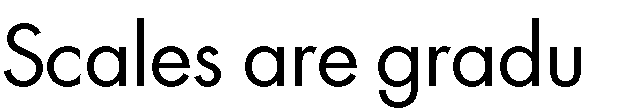
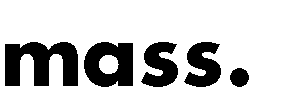
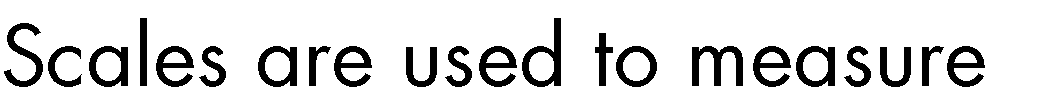




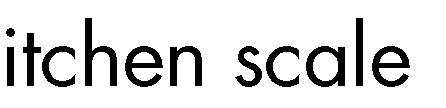
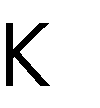
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Scales

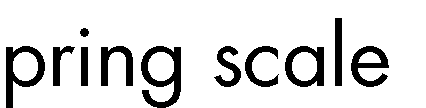
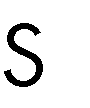




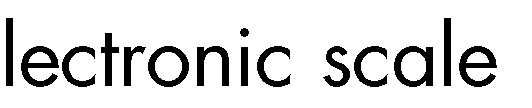
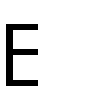
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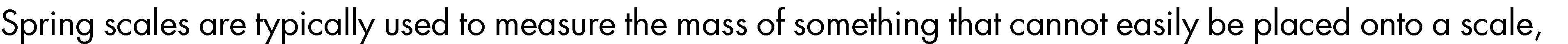
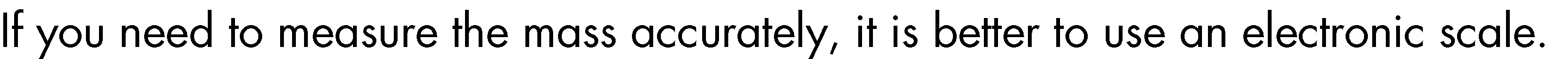


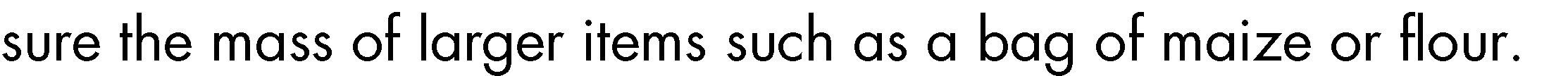
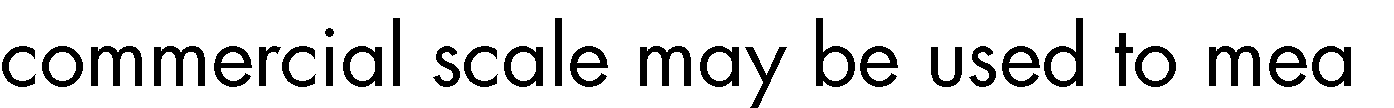
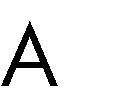
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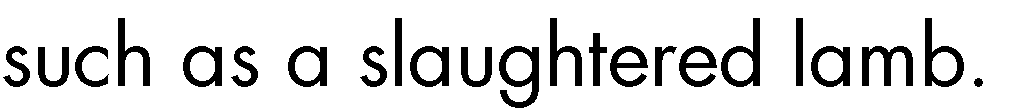


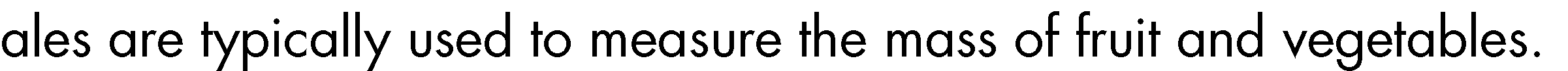
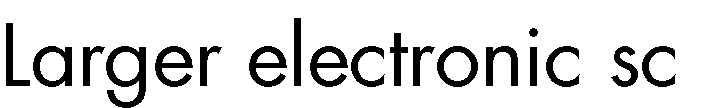
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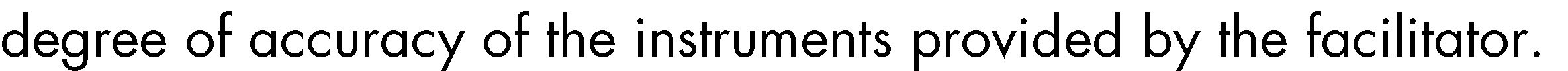
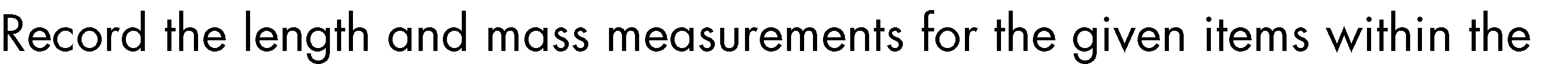
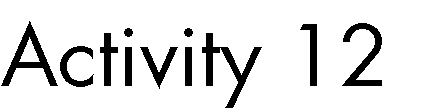




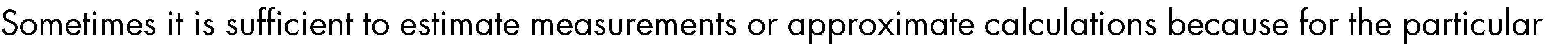
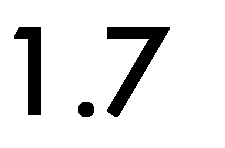


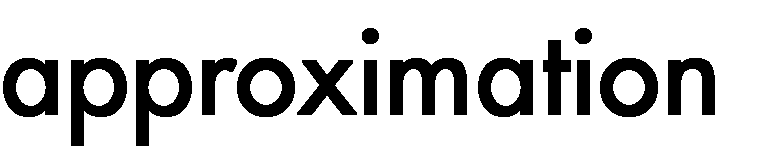
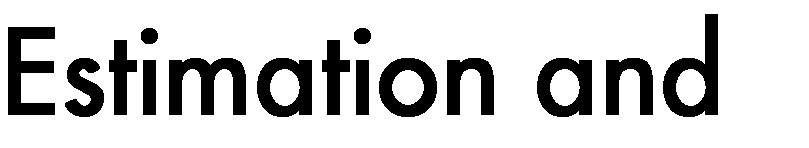


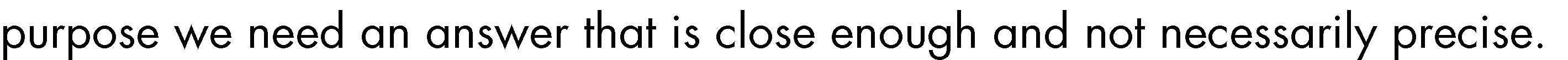


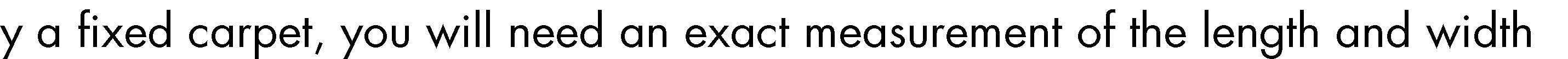
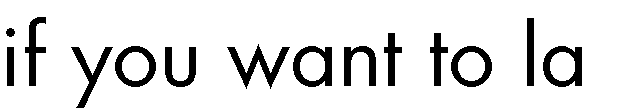
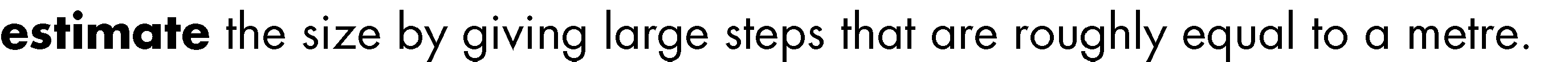
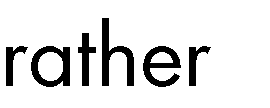
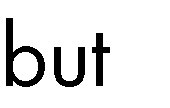
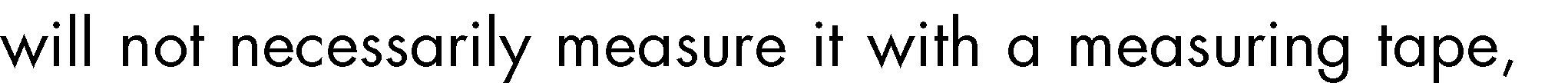
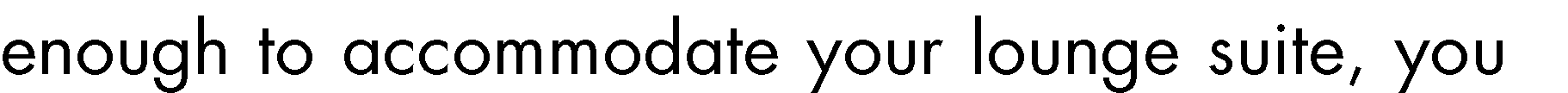
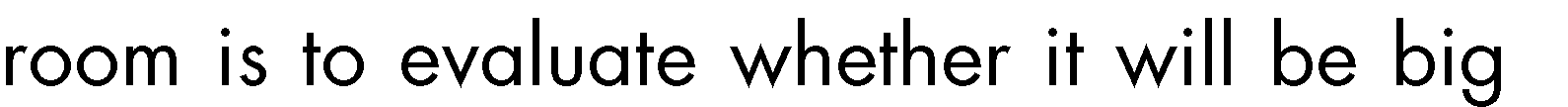
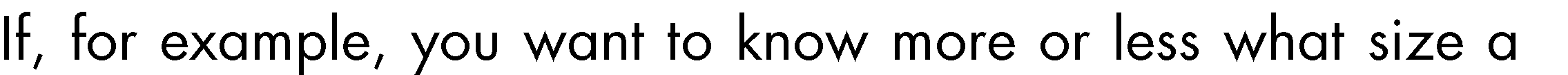


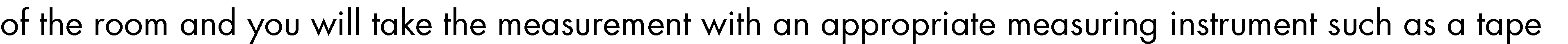


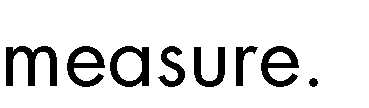


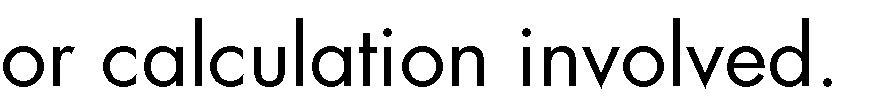


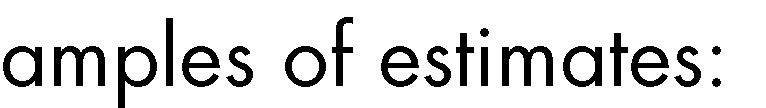
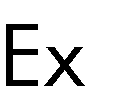
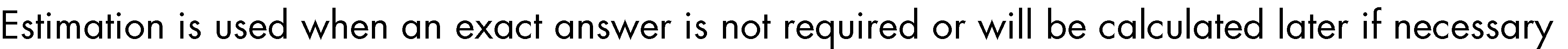
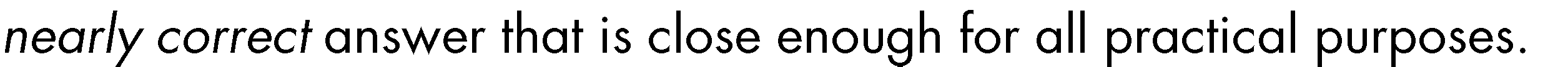
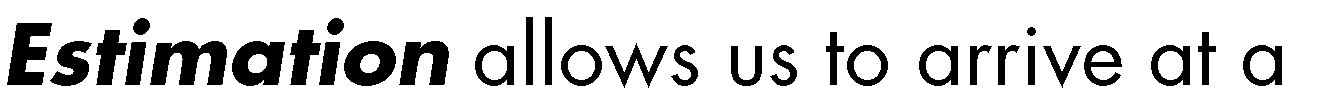
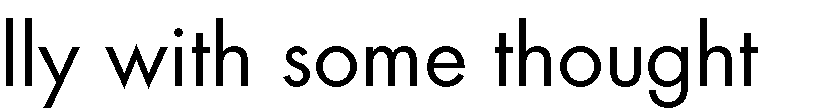
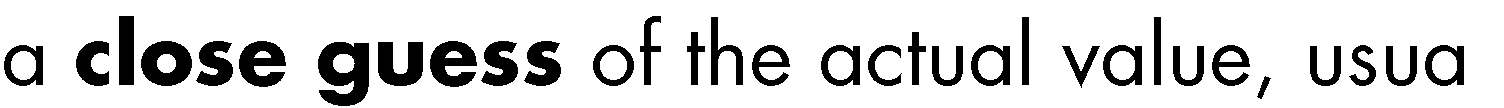
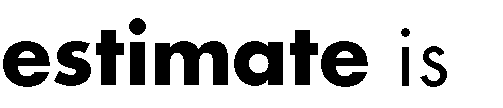
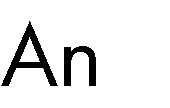


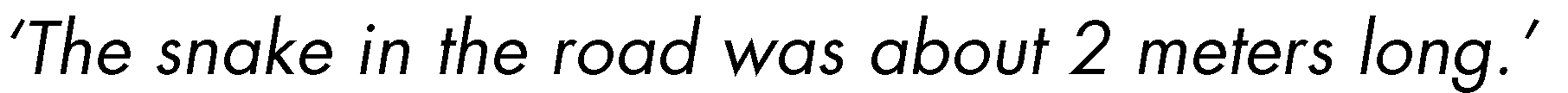


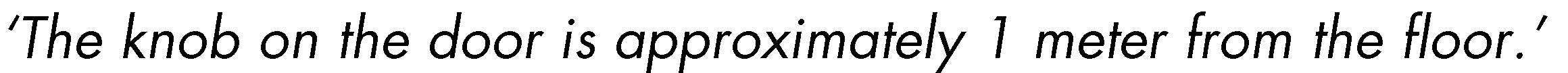


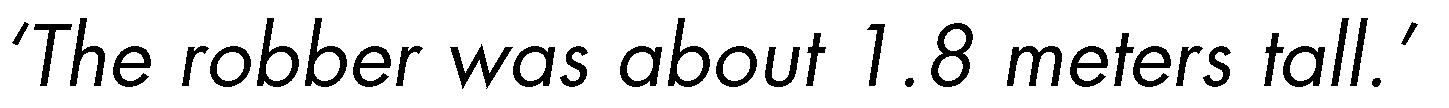


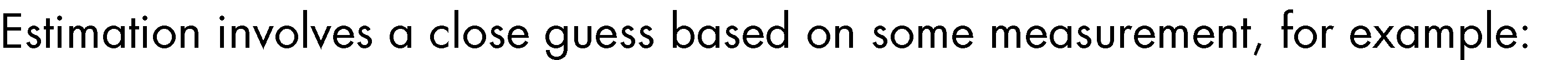
1.7.1 Estimation



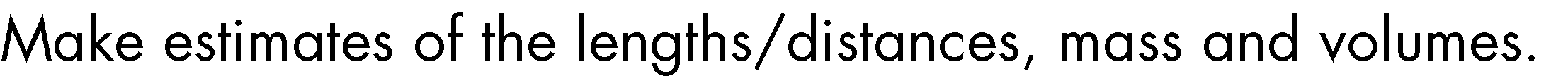
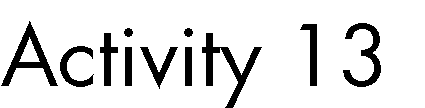
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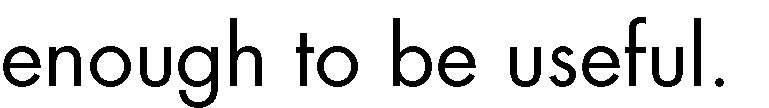


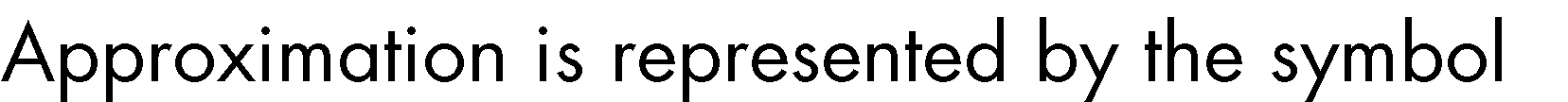
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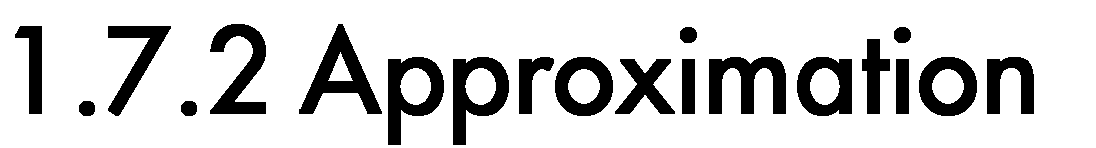
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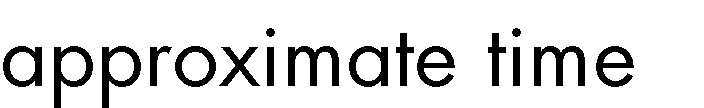
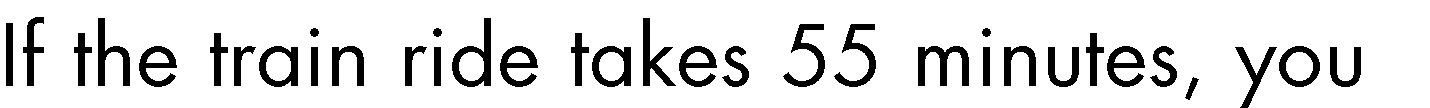
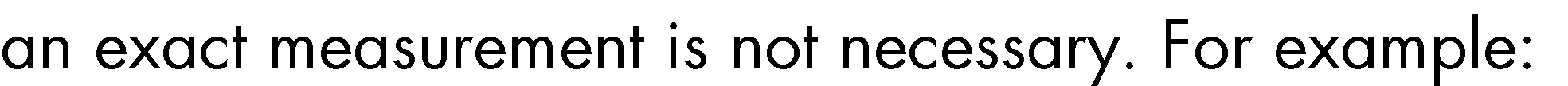
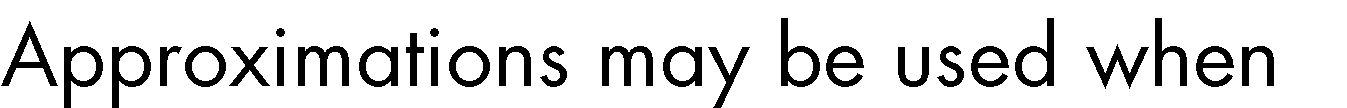
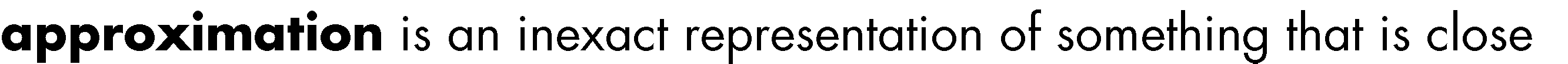
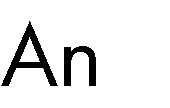






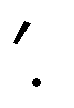
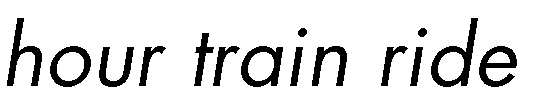
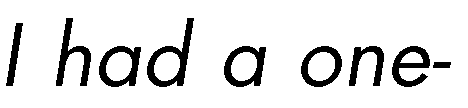
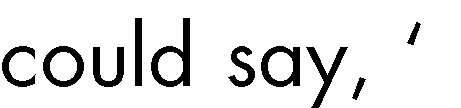
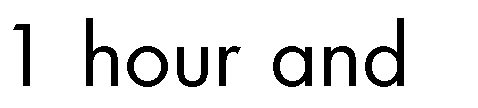
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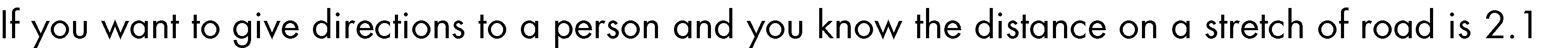


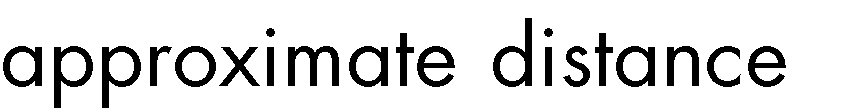
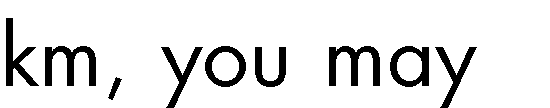


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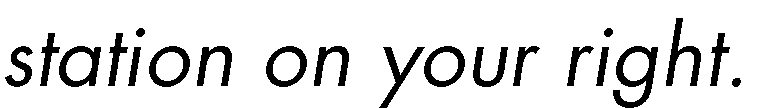
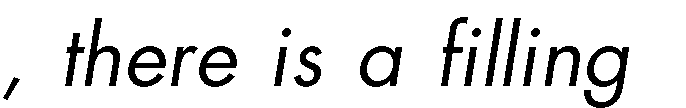
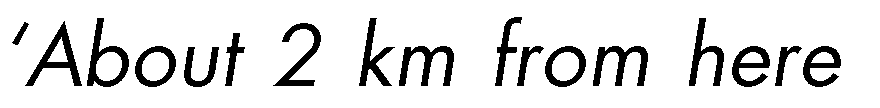
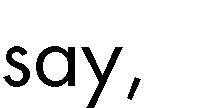
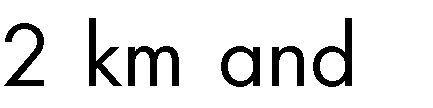
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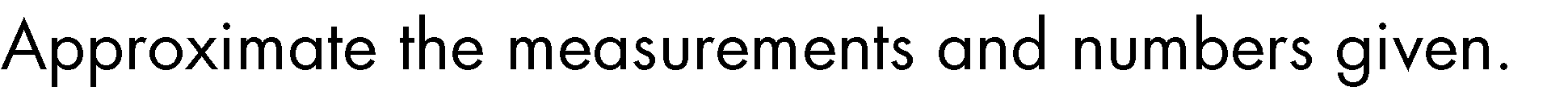
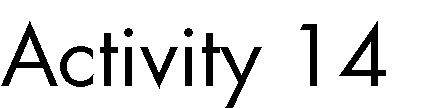
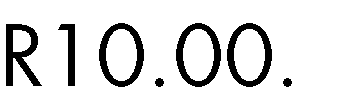


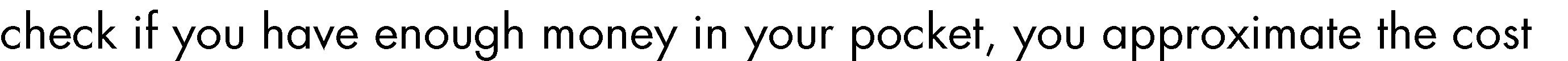
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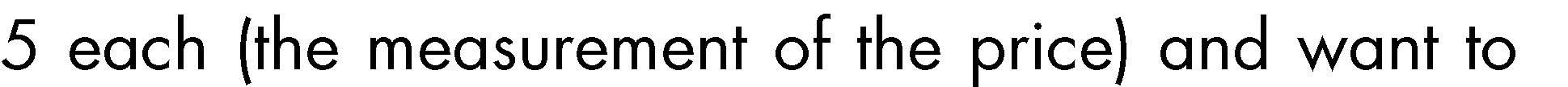
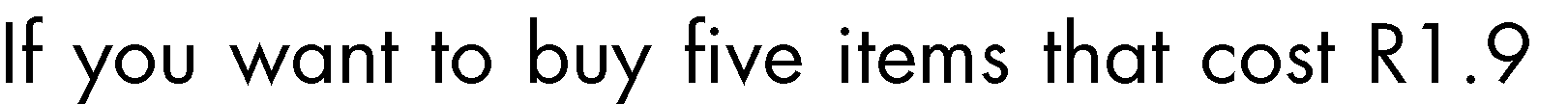
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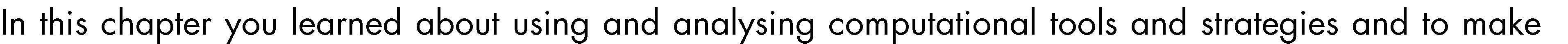


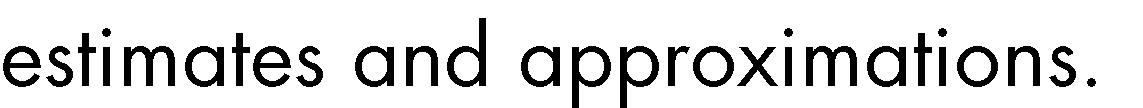
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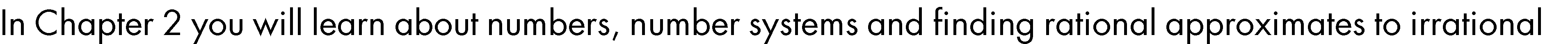


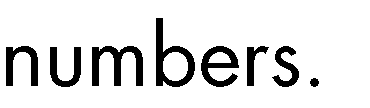
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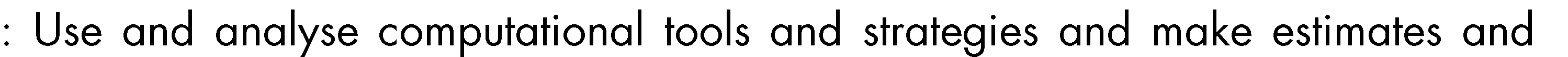
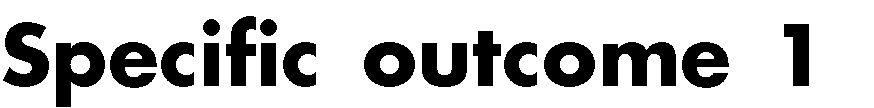


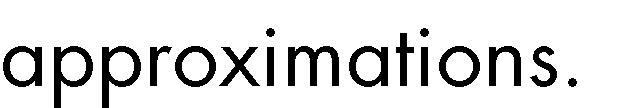


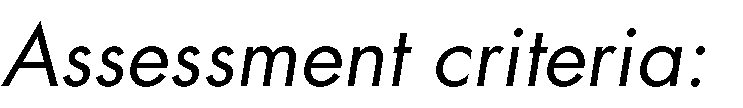


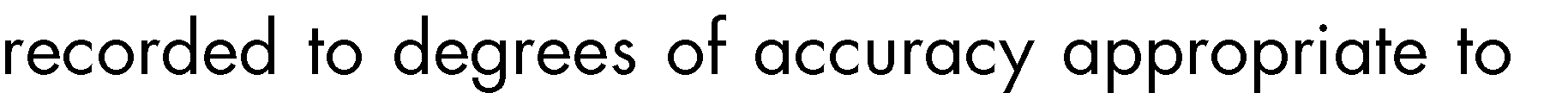
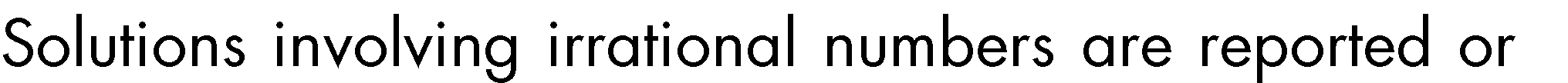


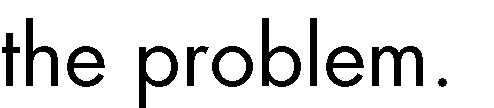


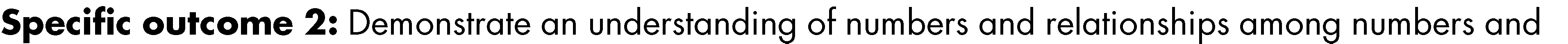


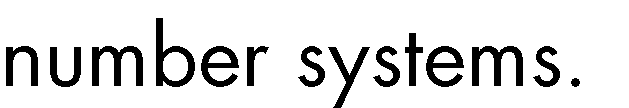


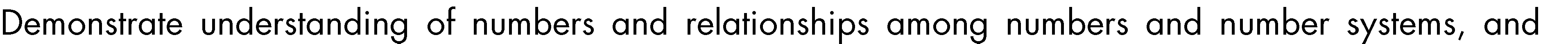
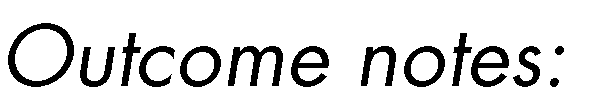


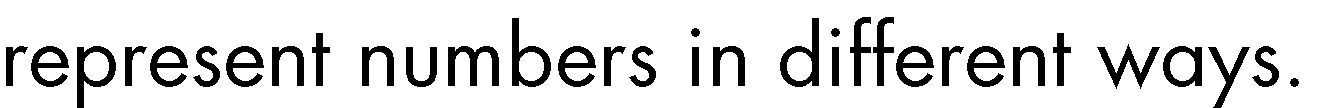


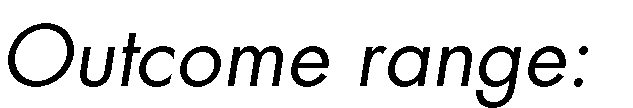




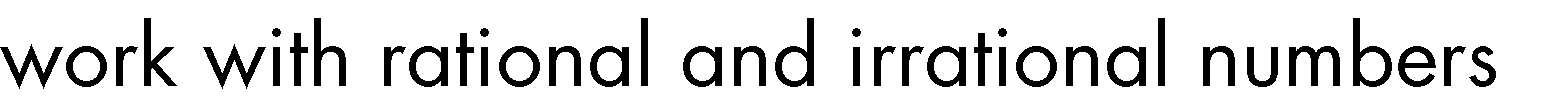
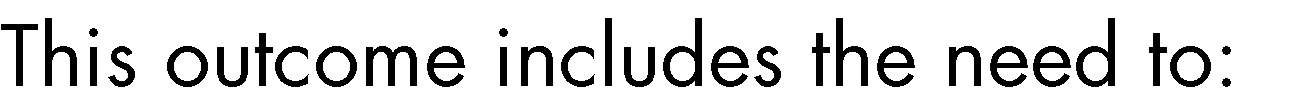


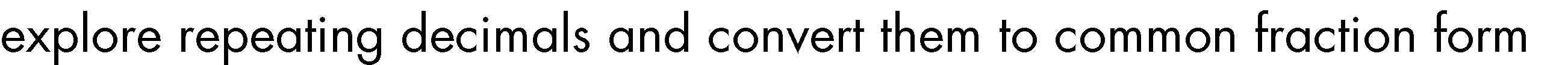




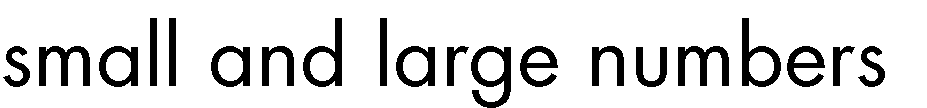
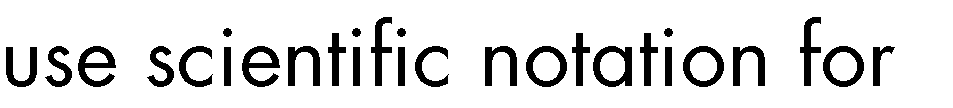


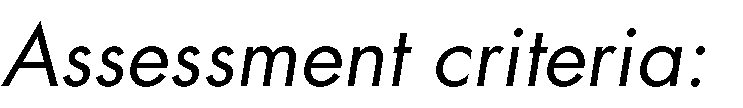
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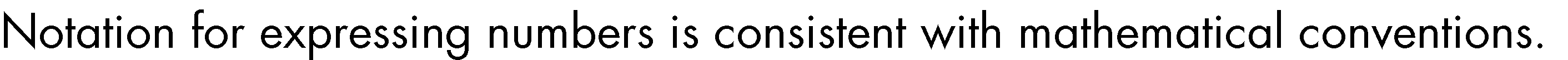


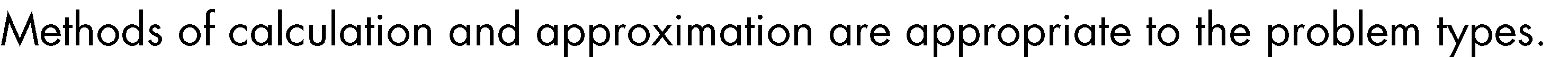
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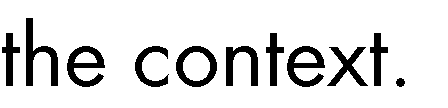
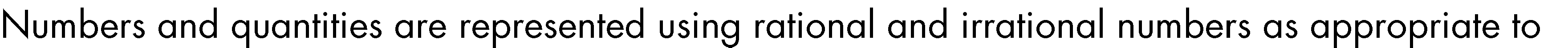
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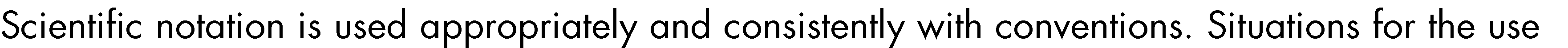


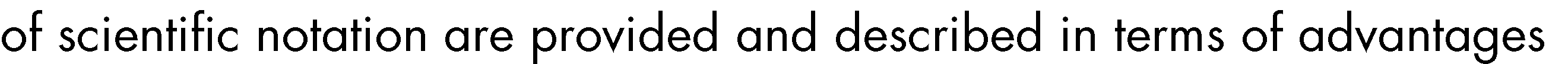


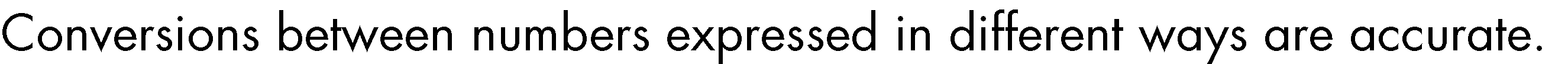
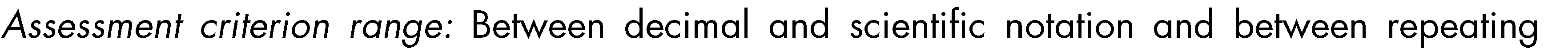
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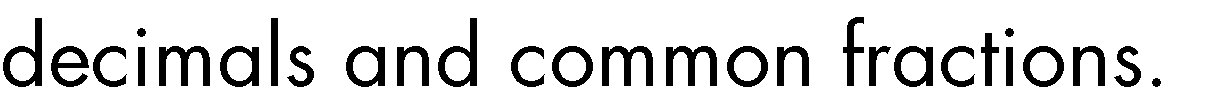
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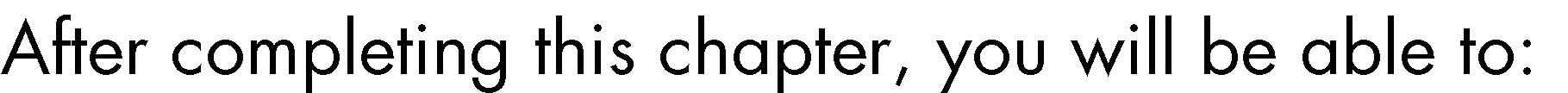
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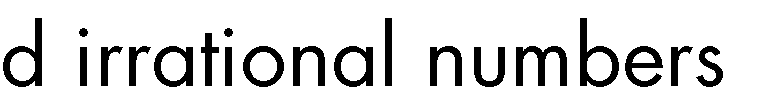
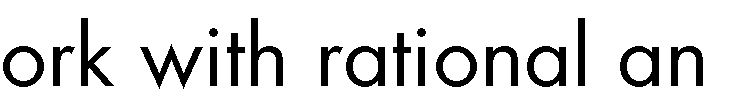
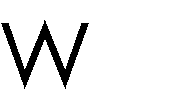


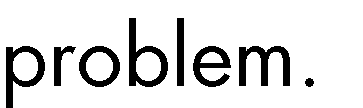
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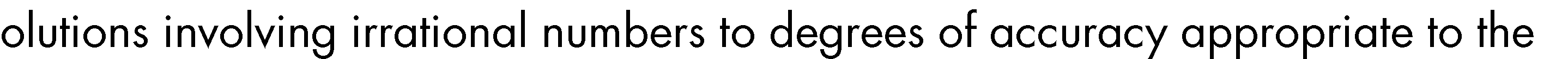
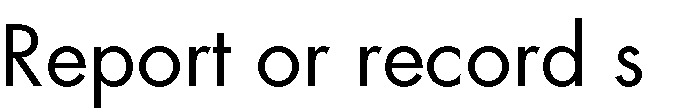




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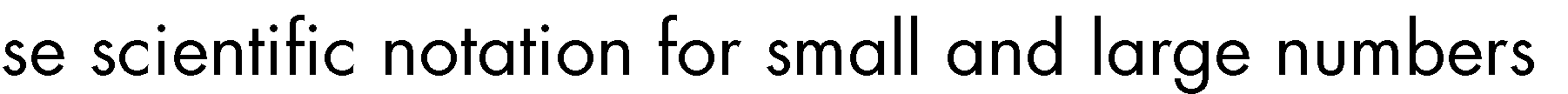
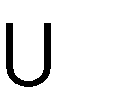
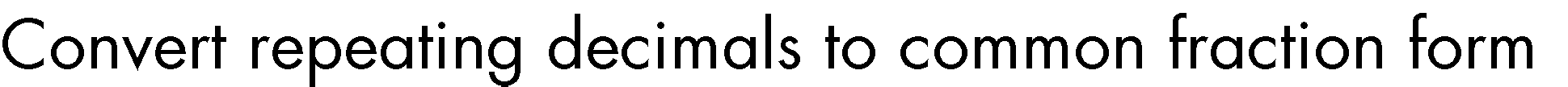


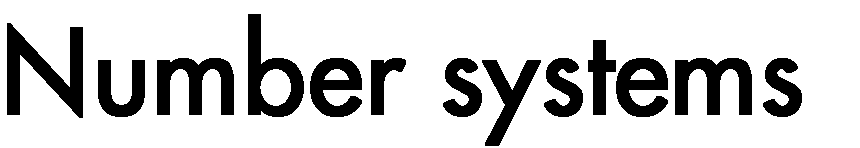
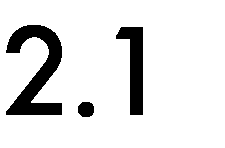
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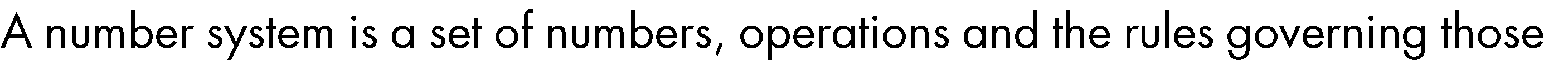


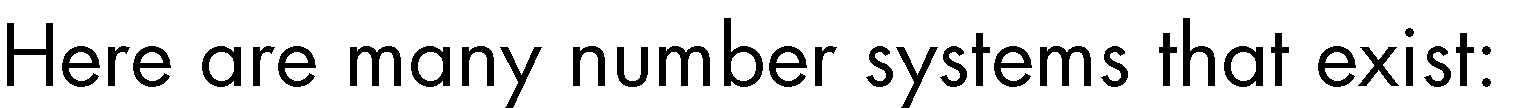
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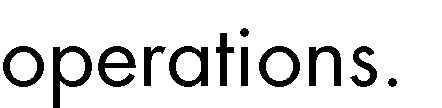
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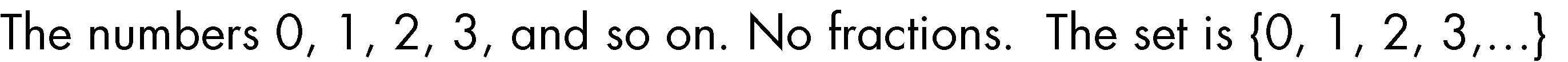
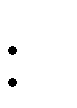
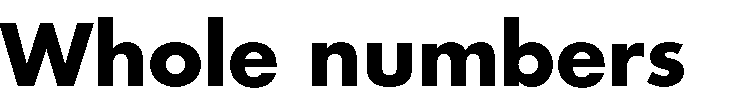




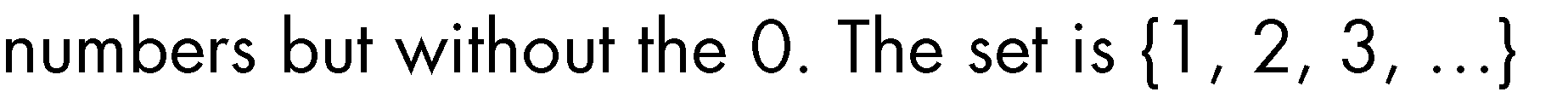
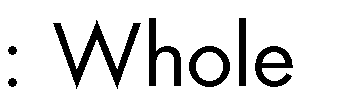
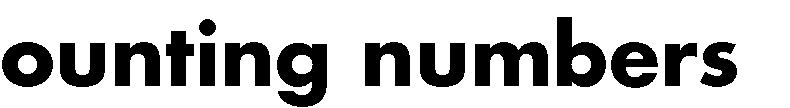
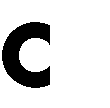


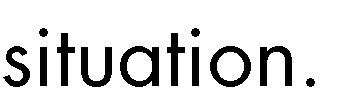


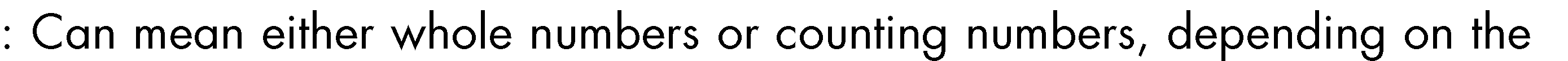
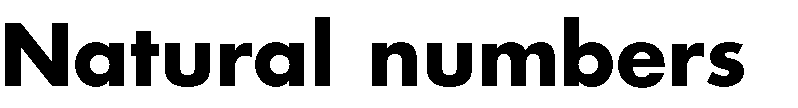
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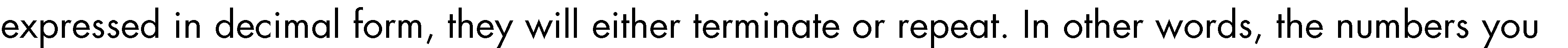
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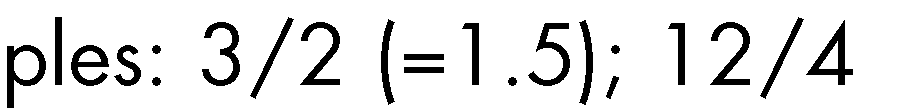
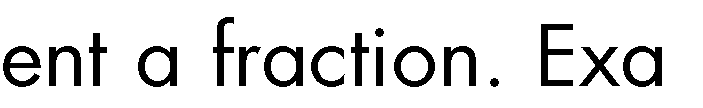
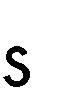
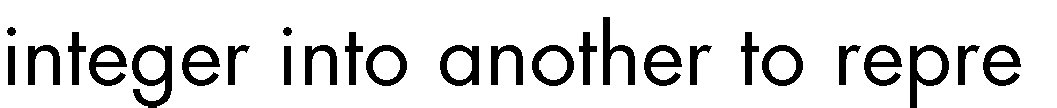
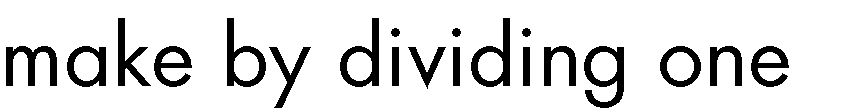
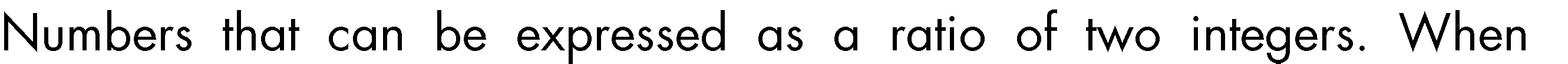
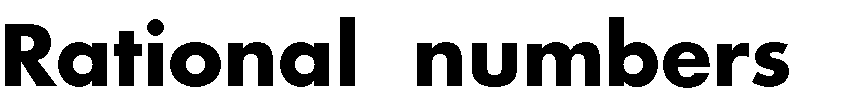
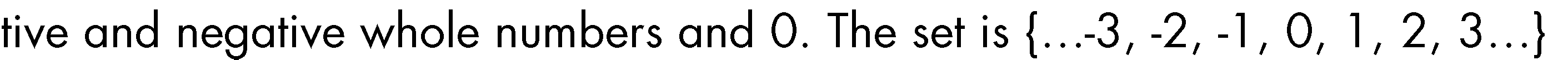
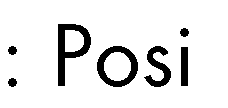
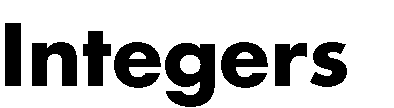


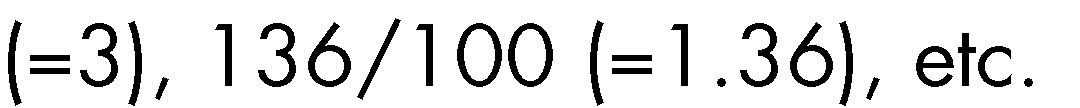
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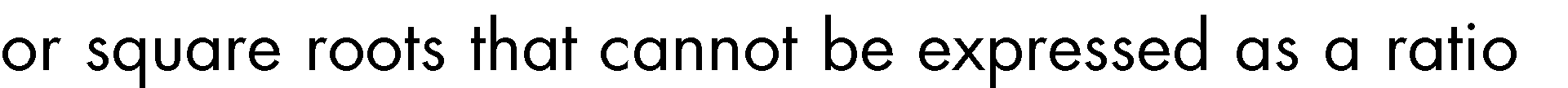


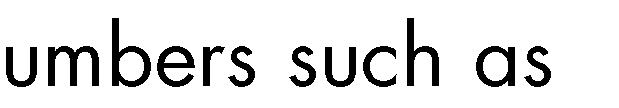
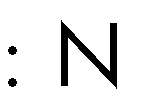
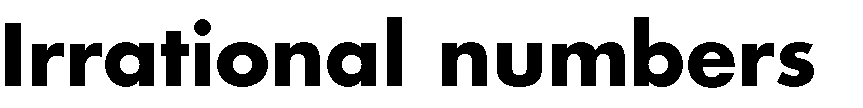
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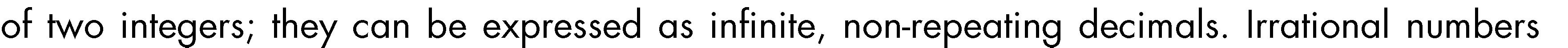


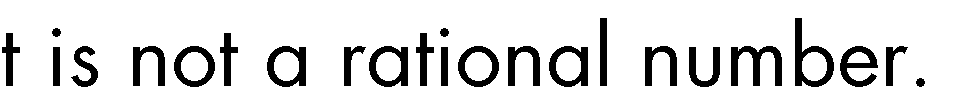
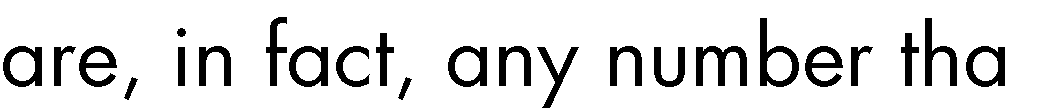


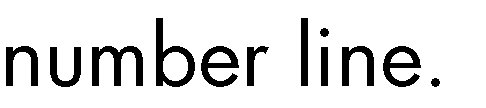


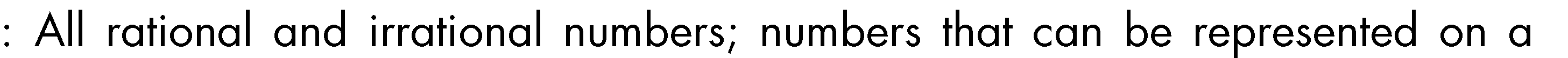
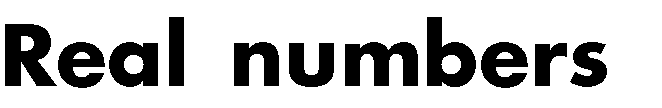
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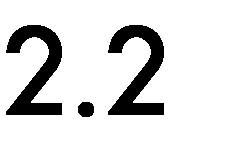
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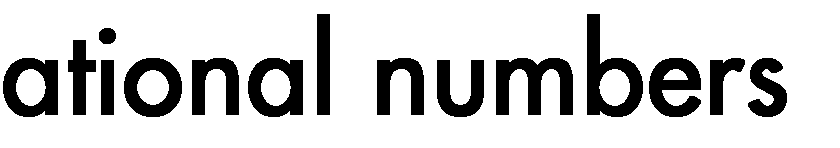
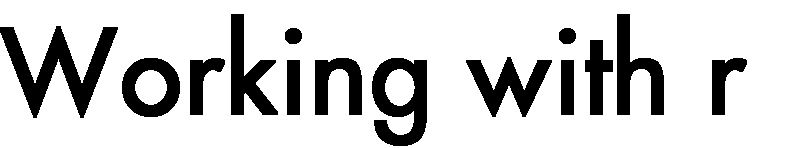


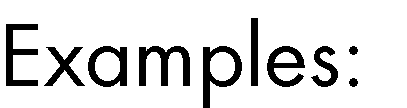
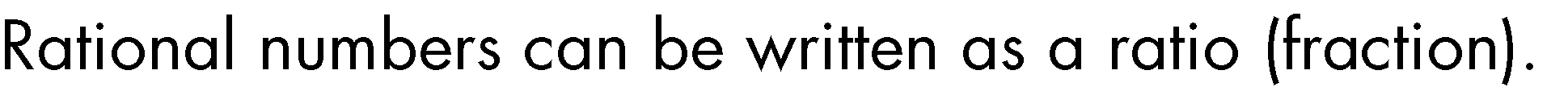


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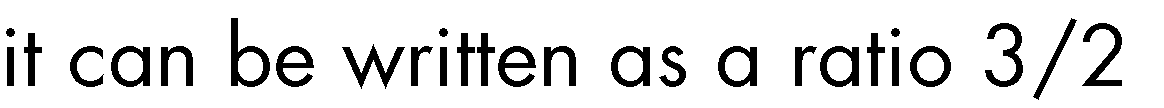
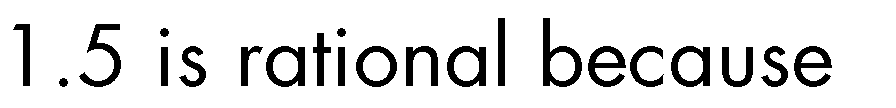


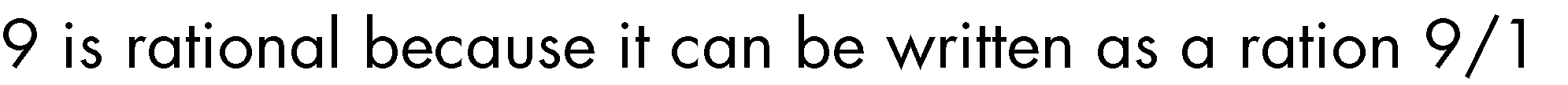


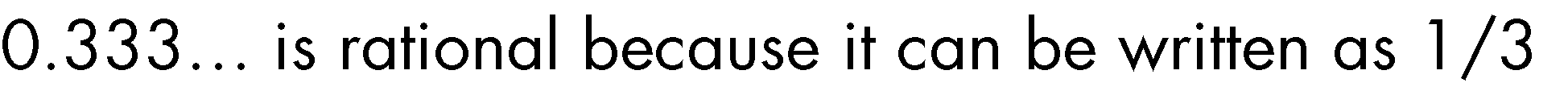




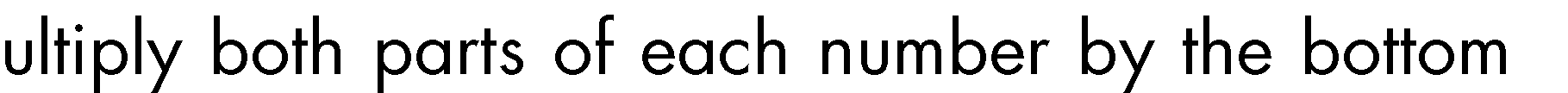
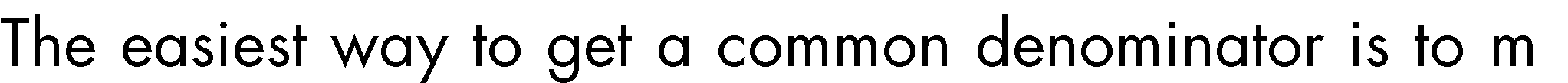
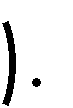
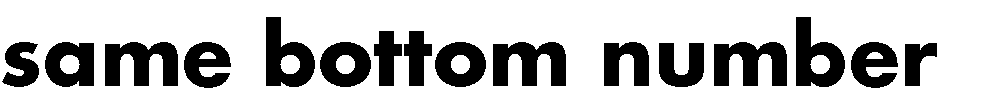
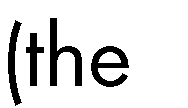
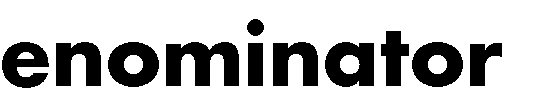
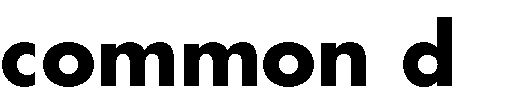
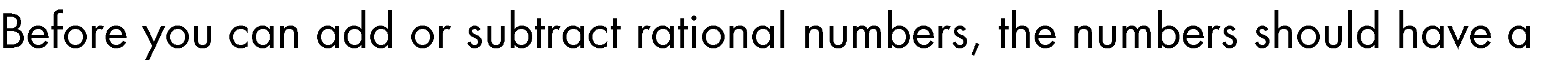
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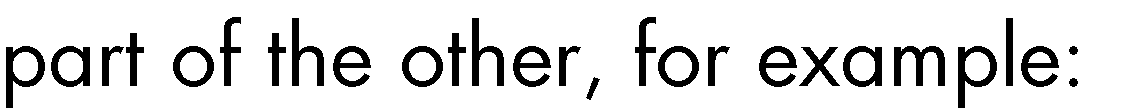


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* + 1. Addition and subtraction





𝑎 𝑐

+

𝑏 𝑑

𝑎

= ( ∗

𝑏

𝑑 𝑐 𝑏

) + ( ∗ )

𝑑 𝑑 𝑏

𝑎𝑑

= +

𝑏𝑑

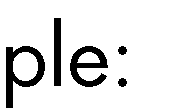
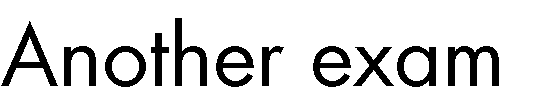
𝑏𝑐

𝑏𝑑

𝑎𝑑 + 𝑏𝑐

=

𝑏𝑑



1 12

+

2 5

1

= ( ∗ 2

5 2 2

) + ( ∗ )

5 5 2

5 + 4

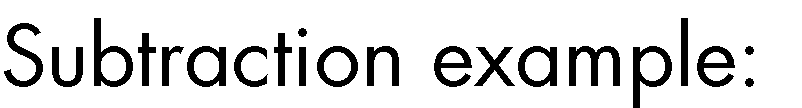
=

10

9

=

10



3 1

−

4 5

3

= ( ∗ 4

5 1 4

) − ( ∗ )

5 5 4

15 − 4

=

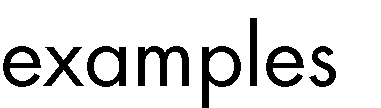
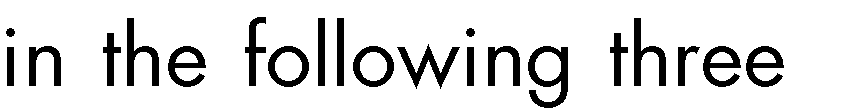
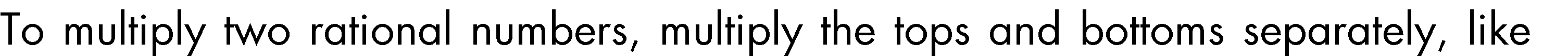
20

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=

20

* + 1. Multiplication



𝑎 𝑐

∗ =

𝑏 𝑑

𝑎𝑐

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1 3 1 ∗ 3 3

∗ = =

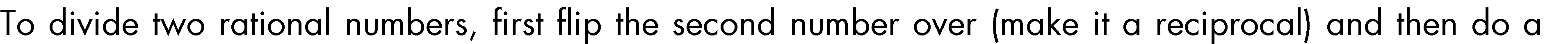
2 4 2 ∗ 4 8

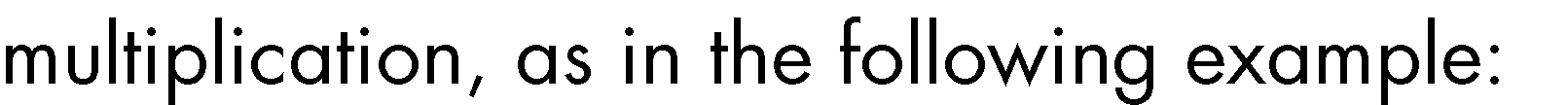
1 2 2 1

𝑥 = =

2 5 10 5

* + 1. Division





𝑎

𝑏 = 𝑎

𝑑 𝑎 ∗ 𝑑 𝑎𝑑

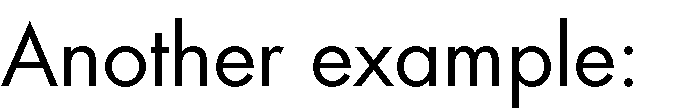
𝑥 = =

𝑐 𝑏 𝑐

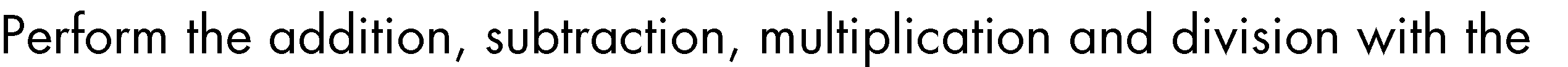
𝑑

𝑏 ∗ 𝑐

𝑏𝑐

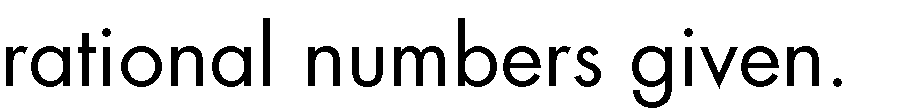
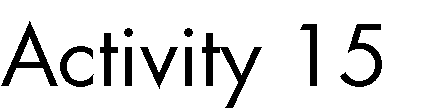


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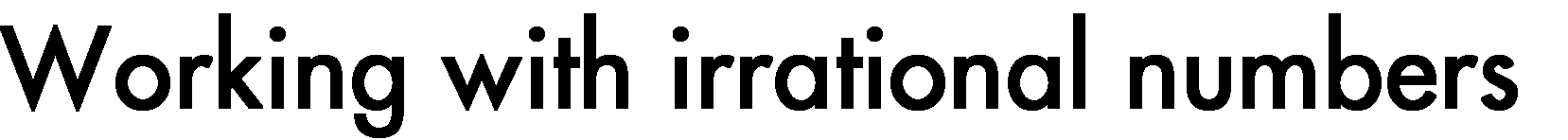
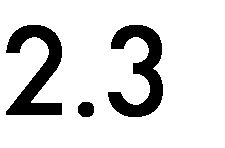
÷ = ∗ = 2 6 2 1

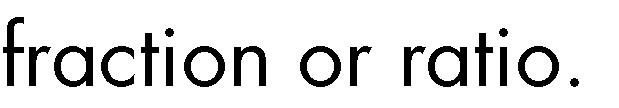
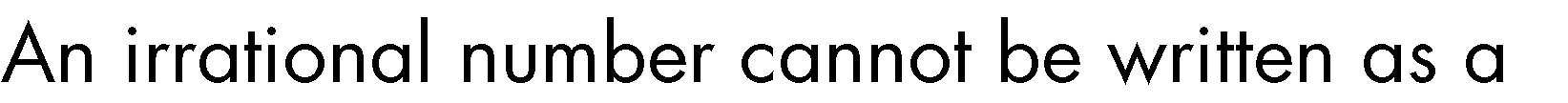
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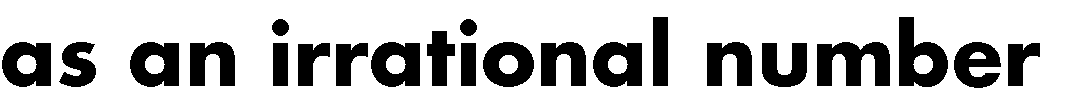
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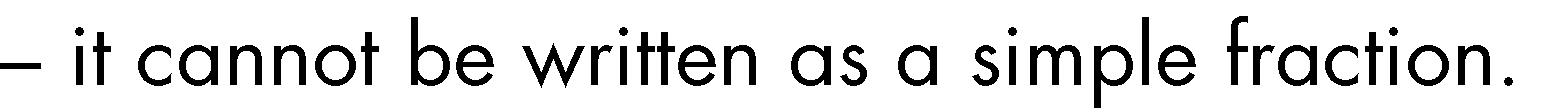
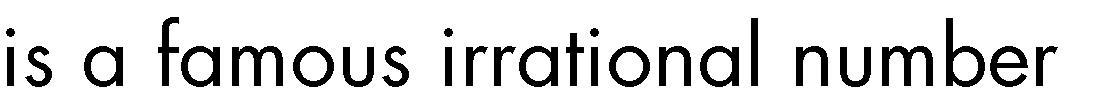


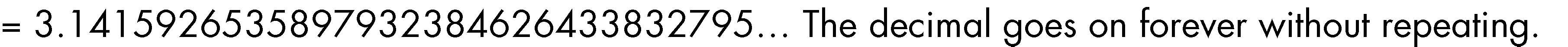


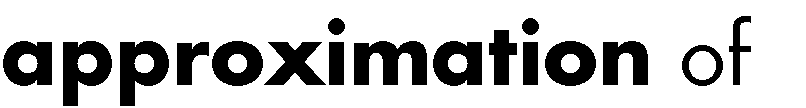
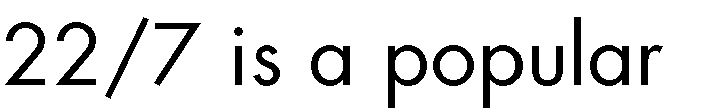
* + 1. Examples of irrational numbers

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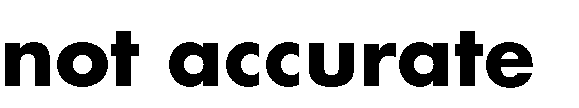
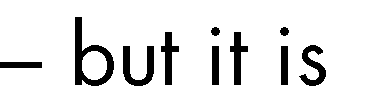
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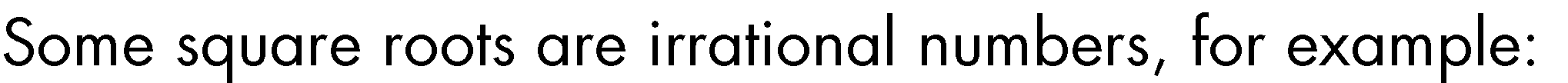
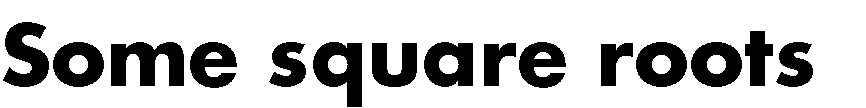


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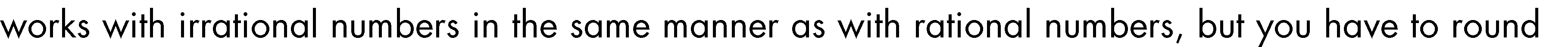
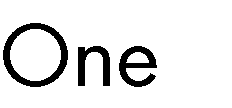
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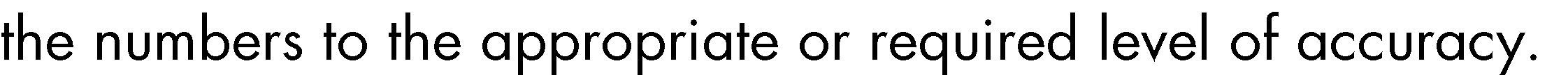




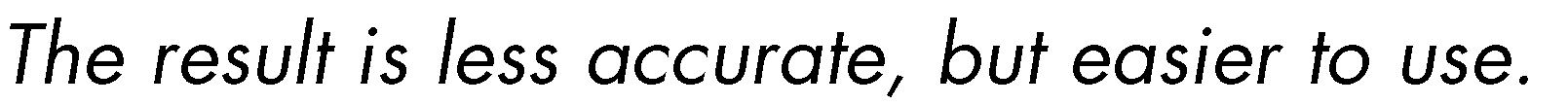
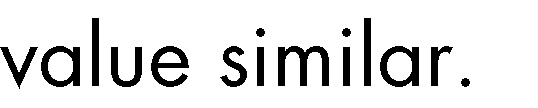
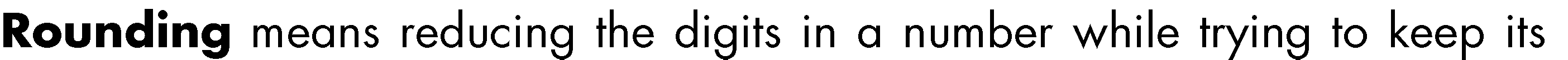
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* + 1. Working with irrational numbers



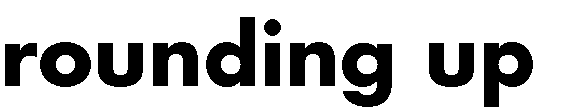
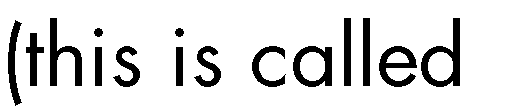
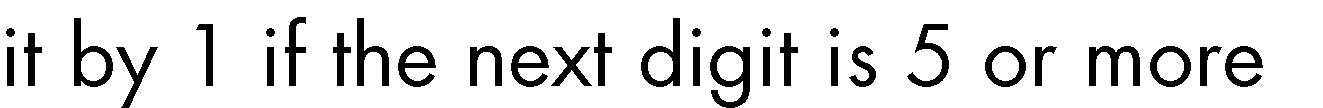
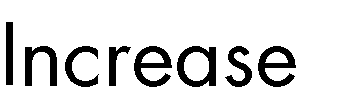
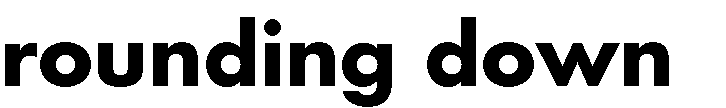
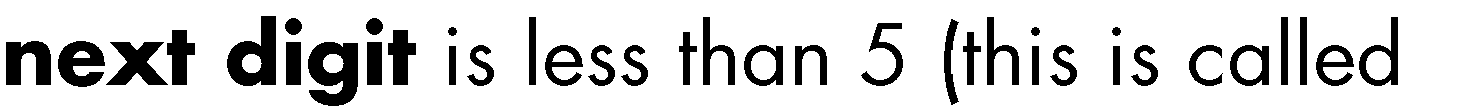
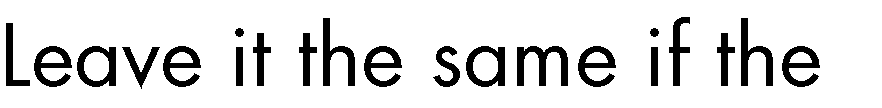
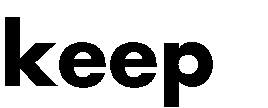
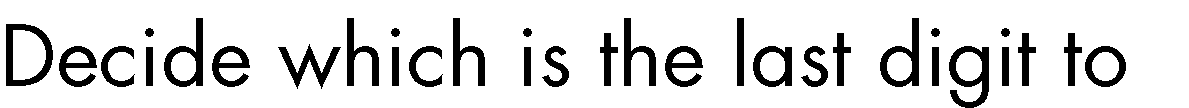


* + 1. Rounding irrational numbers



Steps for rounding numbers

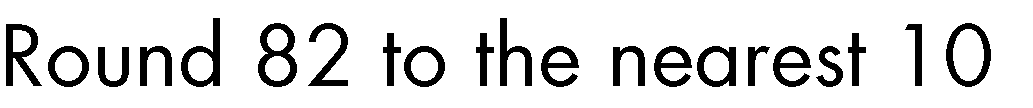
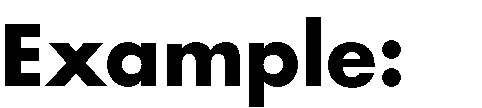
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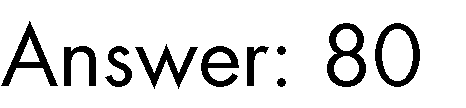
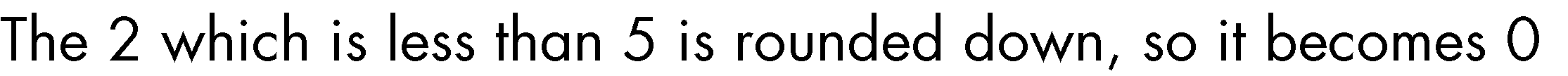
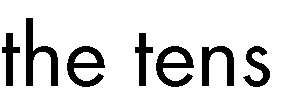
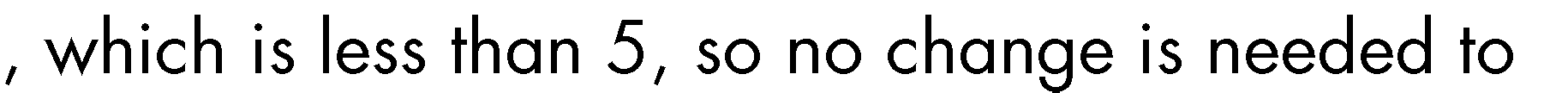
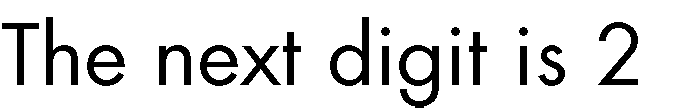
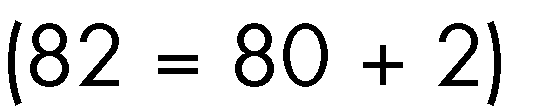
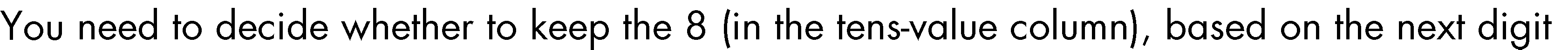
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Rounding to the nearest 10



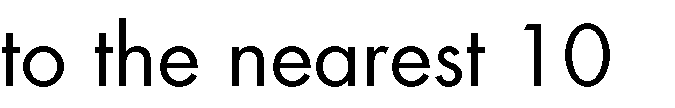
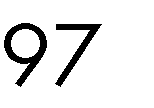
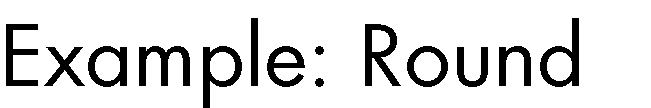
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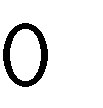
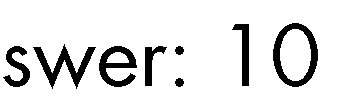
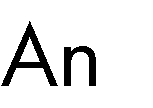
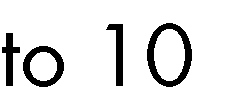
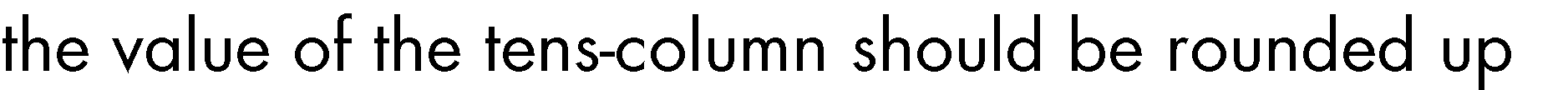
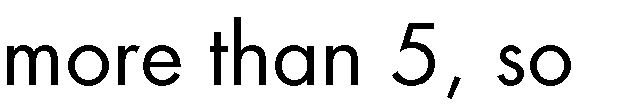
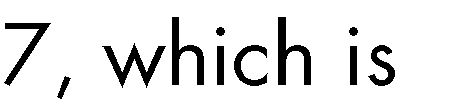
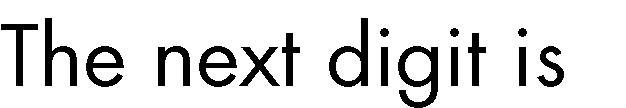
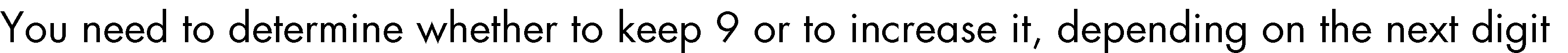
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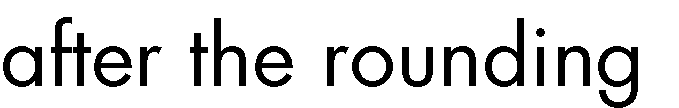
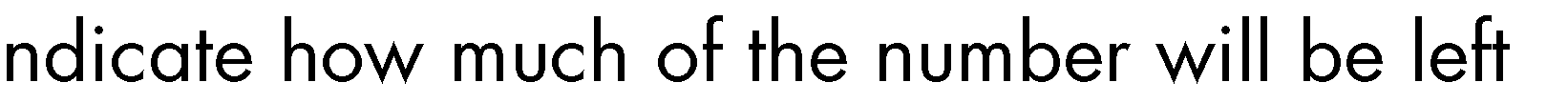
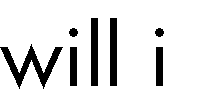
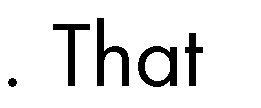
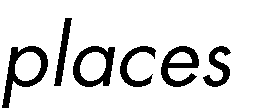
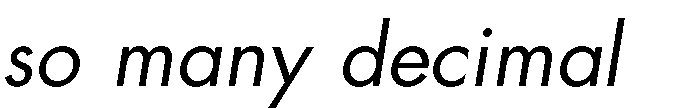
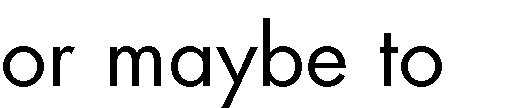
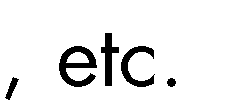
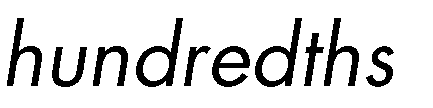
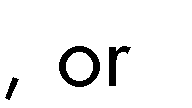
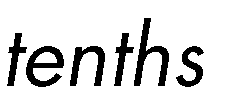
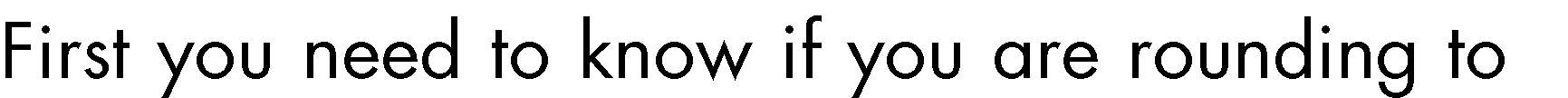
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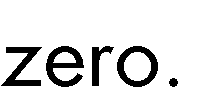
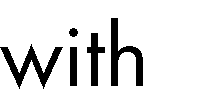
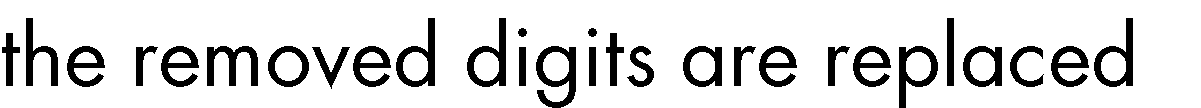
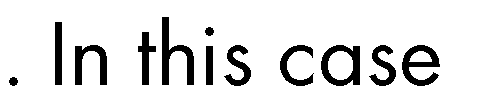
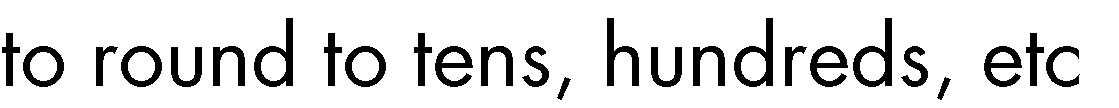
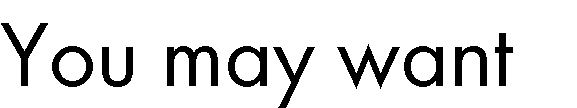
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Rounding decimals



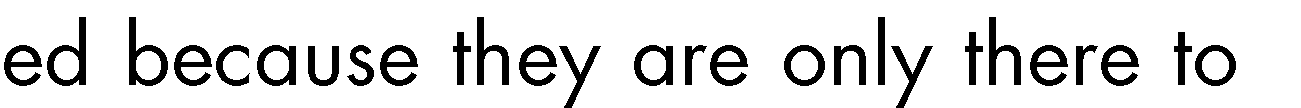
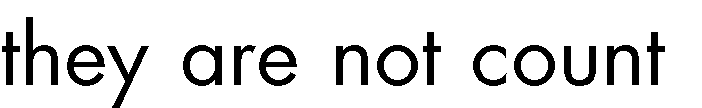
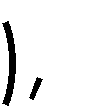
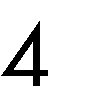
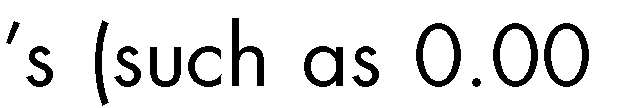
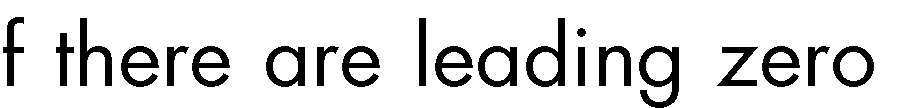
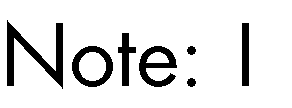
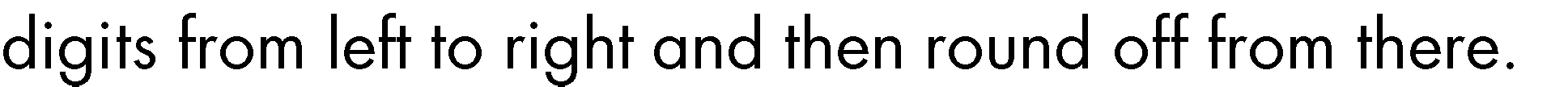
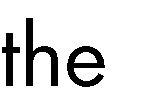
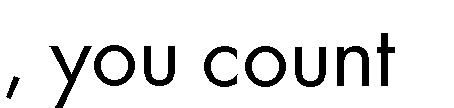
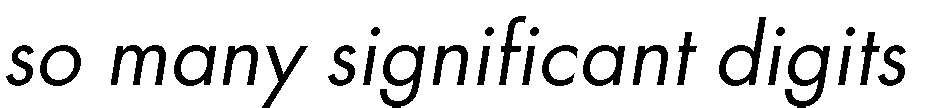
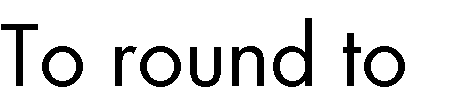
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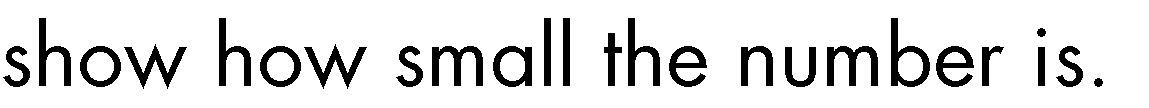
Rounding whole numbers



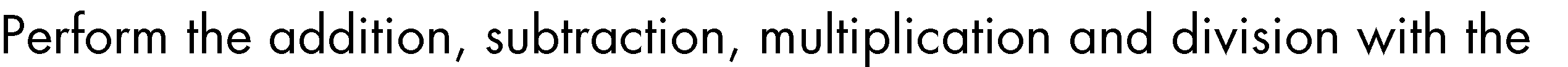
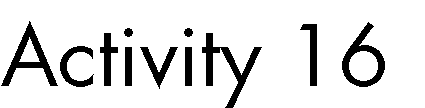
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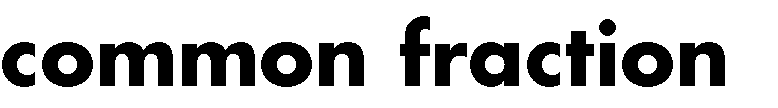
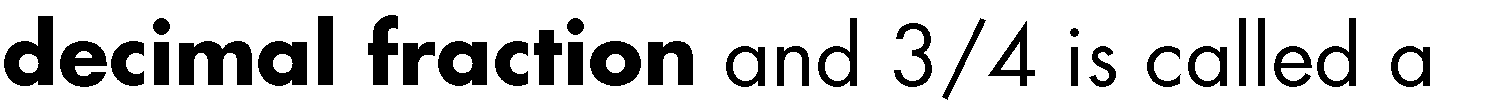
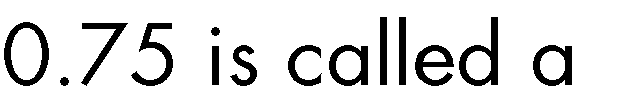
Rounding to significant digits

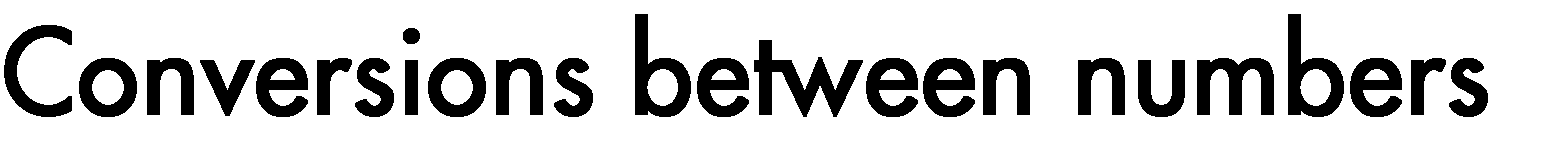
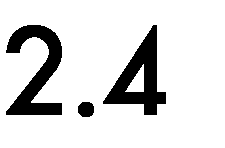


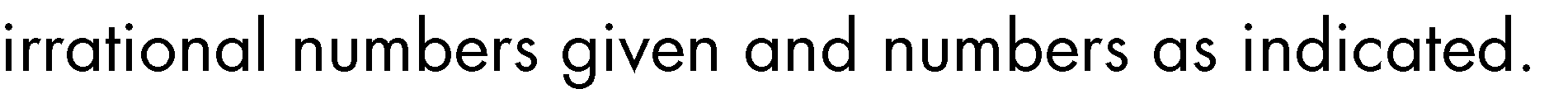


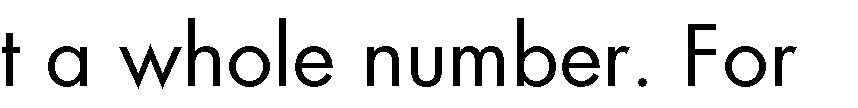
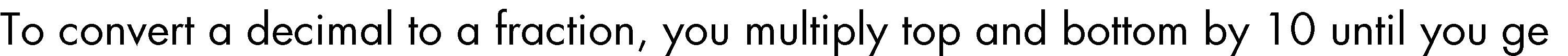
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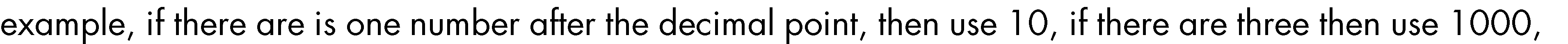


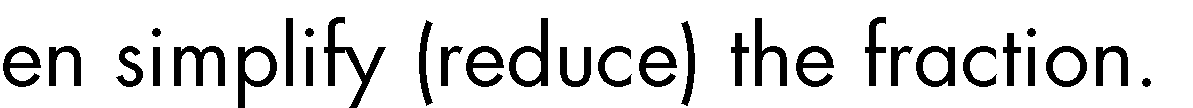
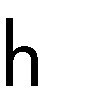
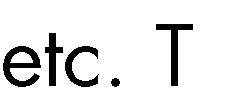


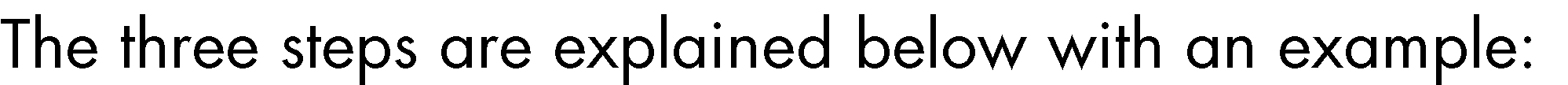


* + 1. Convert decimals to fractions



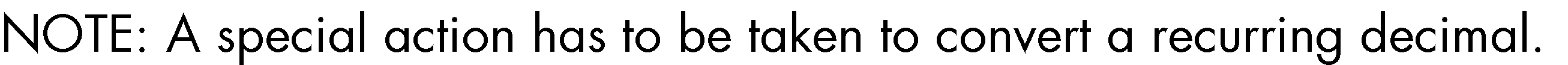


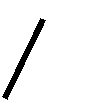
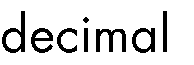
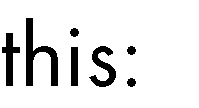


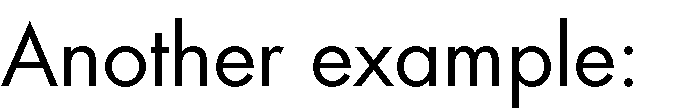


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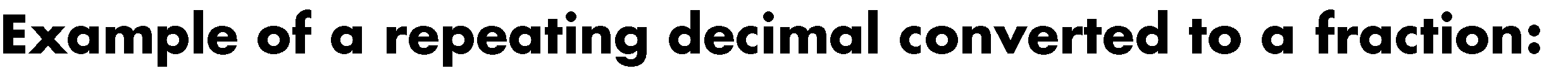


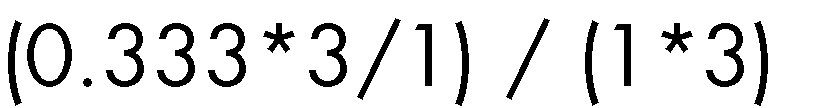
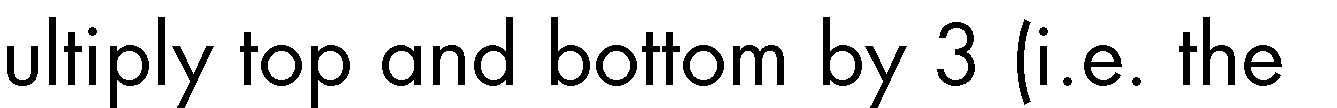
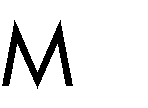
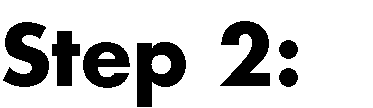
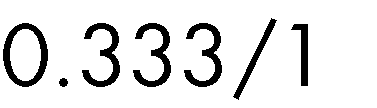
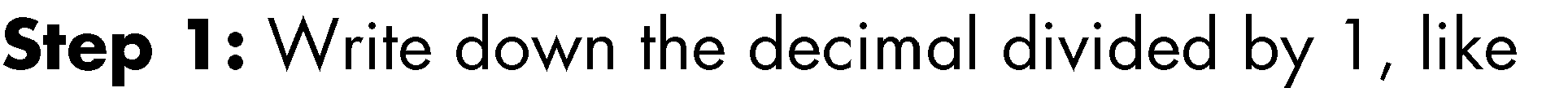
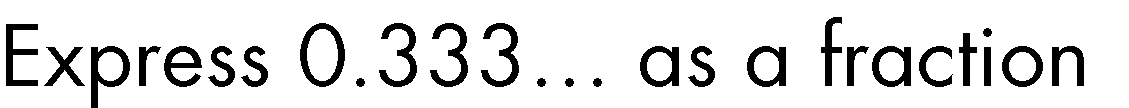


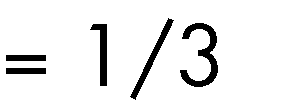
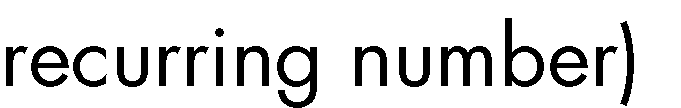


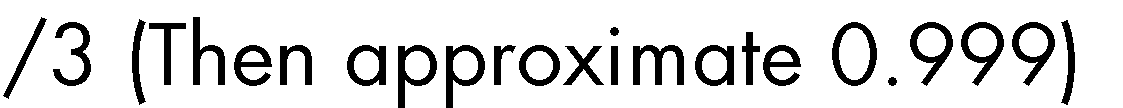
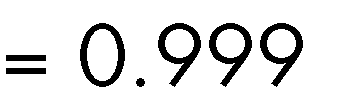


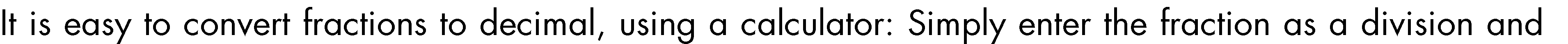
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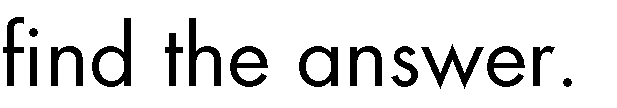


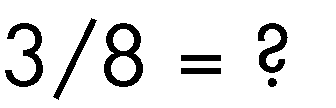
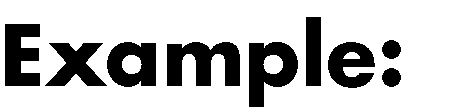


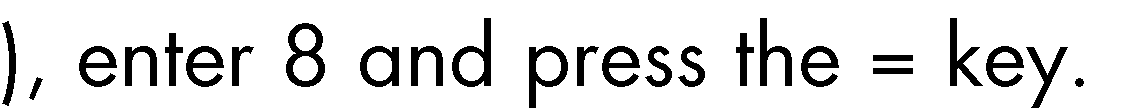
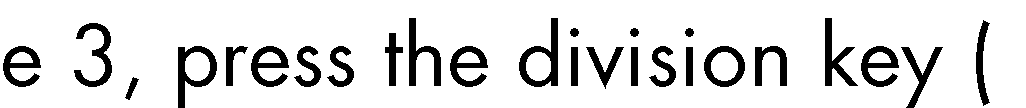
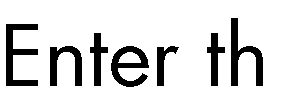
* + 1. Converting fractions to decimals



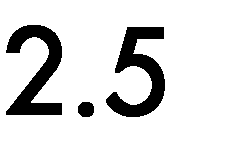
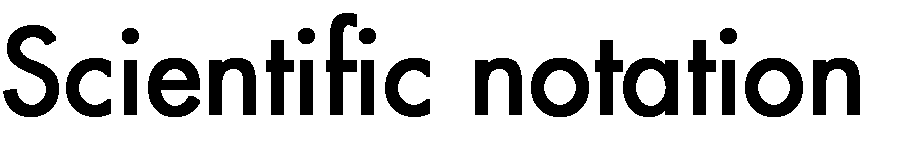


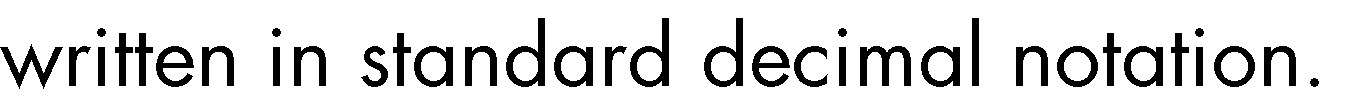


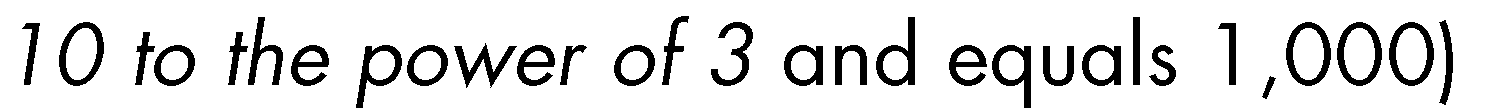
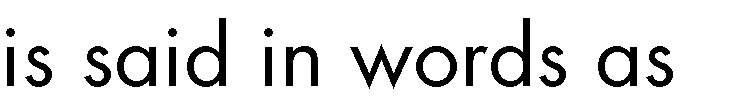
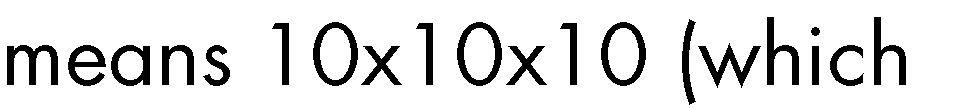
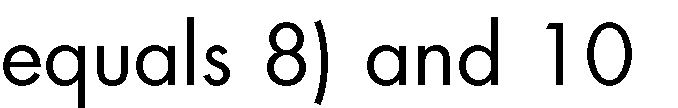
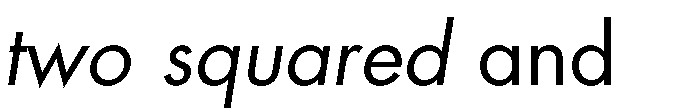
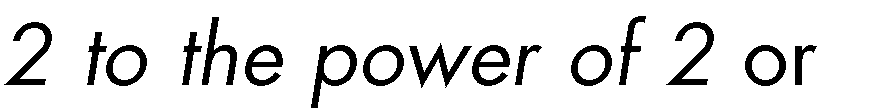
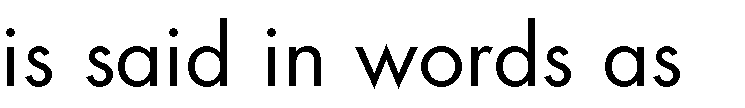
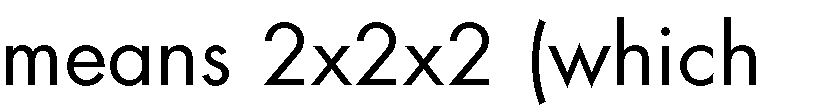
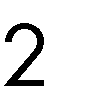
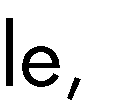
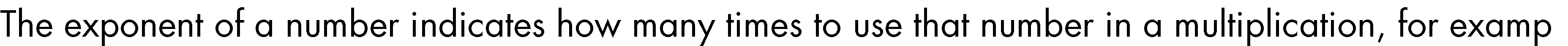
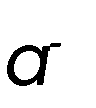
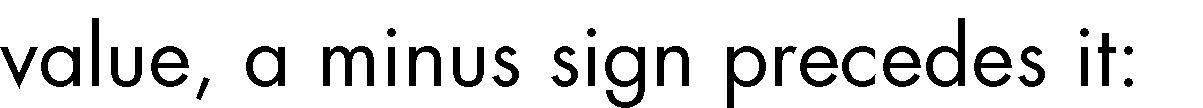
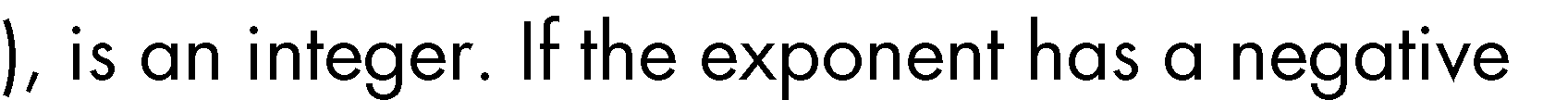
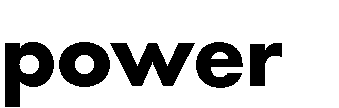
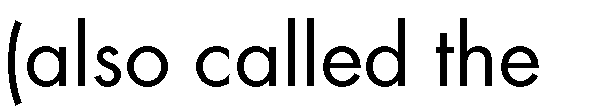
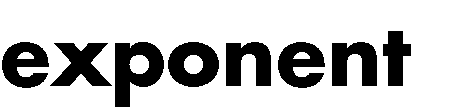
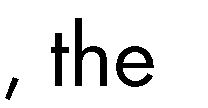
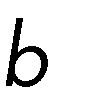
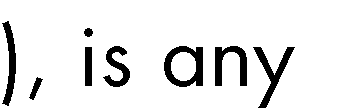
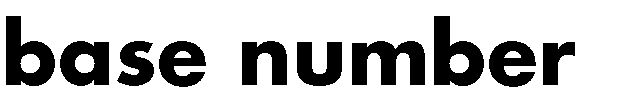
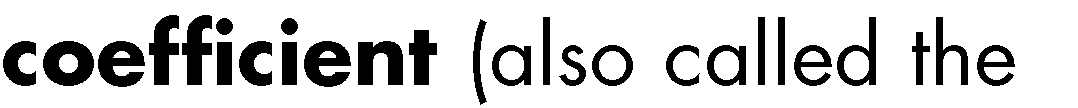
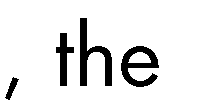
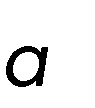
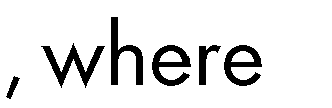
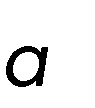
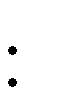
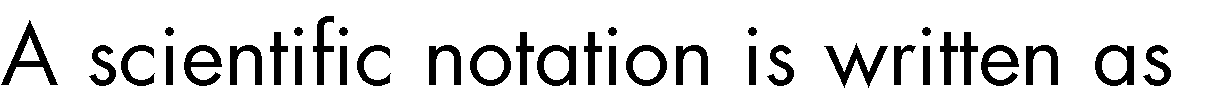
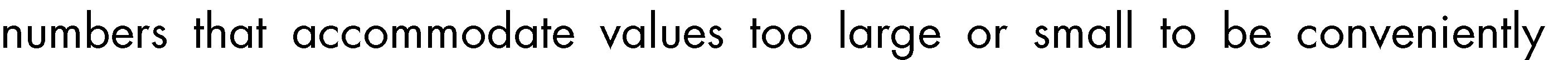
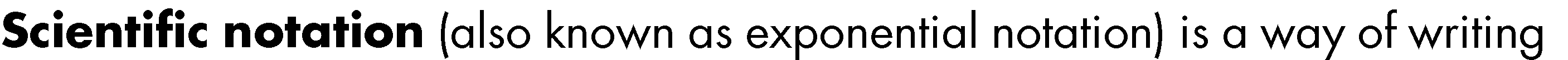


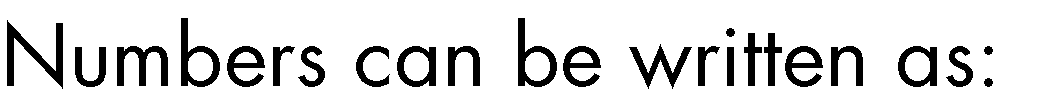


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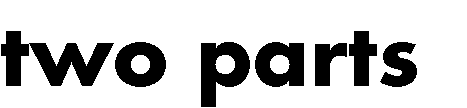
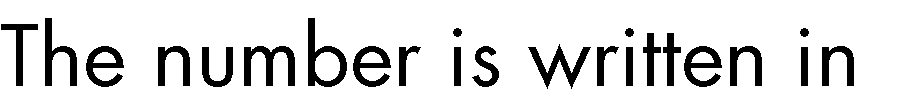
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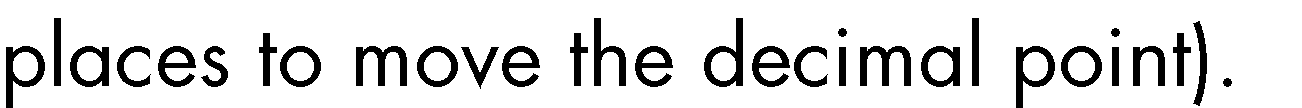
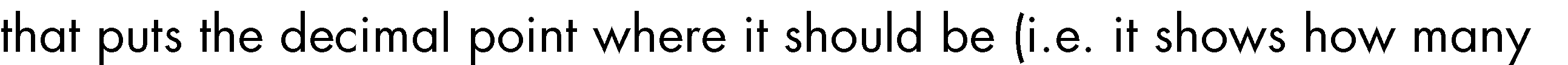
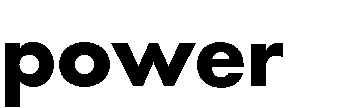
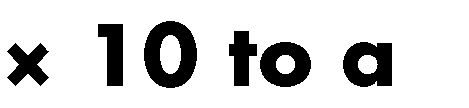
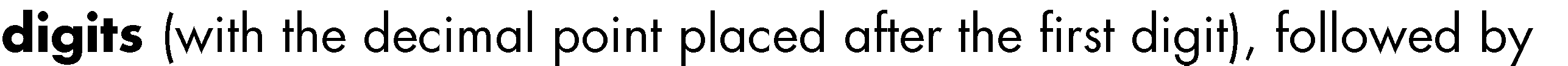
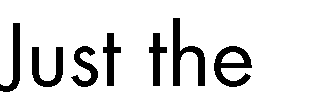


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* + 1. How it is done



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