

# Division with Decimals

①

$$3.1 \overline{) 1245.0000} \quad \text{is same as} \quad \frac{1245}{3.1}$$

$$\text{and} \quad \frac{1245}{3.1} = \frac{1245}{3.1} \left( \frac{10}{10} \right) \\ = \frac{12450}{31}$$

$$\Rightarrow \quad 31 \overline{) 12450}$$

$$\text{i.e.} \quad \frac{1245}{3.1} = \frac{12450}{31}$$

So we move the decimal over the same # of digits inside + outside the divisor sign.

When we divide, using the standard algorithm, we put the digit in our answer directly above the last digit considered in the division.

For example,

$$\begin{array}{r} 4 \\ 31 \overline{) 12450} \\ \underline{-124} \\ 0 \end{array}$$

we ask ourselves "31 goes into 124 how many times?" Since 4 is the last digit considered, we put our guess above the 4.

Then,

$$\begin{array}{r}
 401 \\
 \hline
 31 \overline{) 12450} \\
 \underline{-124} \quad \downarrow \\
 05 \quad \downarrow \\
 \underline{-0} \quad \downarrow \\
 50 \quad \downarrow \\
 \underline{-31} \\
 19
 \end{array}$$

We ~~ask~~ think,  
 "31 goes into 05  
 0 times"

Then, we ask  
 "31 goes into 50  
 how many times?" We  
 put our answer directly over the zero  
 which is the last digit considered.

=> answer:  $401 \frac{19}{31}$

So, if we have decimals, we do the division  
 exactly the same. We just put the decimal  
 in our answer directly above where it  
 is under the divisor sign + proceed as  
 normal.

ex

$$2.03 \overline{) 17.4689}$$

=>

$$\begin{array}{r}
 8.605 \\
 \hline
 203 \overline{) 1746.890000} \\
 \underline{-1624} \quad \downarrow \\
 1228 \quad \downarrow \\
 \underline{-1218} \quad \downarrow \\
 109 \quad \downarrow \\
 \underline{-0} \\
 1090 \\
 \underline{-1015}
 \end{array}$$

=>  $17.4689 \div 2.03$   
 $\approx 8.605$

Here are some more to try, if you want more experience.

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$$1) \quad 1.08 \overline{) 32,004.72}$$

$$2) \quad 37.1 \overline{) 16016.812}$$

$$3) \quad 27 \overline{) 2785.05}$$