

## Fractions, Decimals + Percents

Percent - a ratio that compares a # to 100

4 ways to write:  $\frac{4}{15}$  4:15 4 to 15 4 out of 15

\* To use percents in math, must change them to a frac. or dec.

Change % to frac.

$$1) 28\% = \frac{28}{100} = \boxed{\frac{7}{25}}$$

↑  
% means  
out of 100

$$\begin{array}{r} 2 \overline{) 28 \ 100} \\ \underline{2 \ 14 \ 50} \\ \phantom{2} 7 \ 25 \end{array}$$

$$2) 40\% = \frac{40}{100} = \boxed{\frac{2}{5}}$$

$$3) 36\% = \frac{36}{100} = \boxed{\frac{9}{25}} \quad \begin{array}{r} 2 \overline{) 36 \quad 100} \\ 2 \overline{) 18 \quad 50} \\ \quad 9 \quad 25 \end{array}$$

$$4) 118\% = \frac{118}{100} = \frac{59}{50} = \boxed{\frac{19}{50}} \quad \begin{array}{r} 2 \overline{) 118 \quad 100} \\ \quad 59 \quad 50 \end{array}$$

$$5) 125\% = \frac{125}{100} = \frac{5}{4} = \boxed{\frac{1}{4}}$$

Think quarters

Fractions  $\rightarrow$  %

$$1) \frac{1}{5} = \frac{1 \cdot 20}{5 \cdot 20} = \frac{20}{100} = 20\%$$

$$2) \frac{3}{10} = \frac{3 \cdot 10}{10 \cdot 10} = \frac{30}{100} = 30\%$$

$$3) \frac{9}{4} = \frac{9 \cdot 25}{4 \cdot 25} = \frac{225}{100} = 225\%$$

$$4) \frac{7}{2} = \frac{7 \cdot 50}{2 \cdot 50} = \frac{350}{100} = 350\%$$

\* Factors of 100: 2, 5, 4, 10, 25, 20, 50, 1, 100

% → Dec.

$$1) 65\% = \frac{65}{100} = 0.\underline{6}\underline{5}$$

$$2) 19\% = \frac{19}{100} = 0.\underline{1}\underline{9}$$

$$3) 3\% = \frac{3}{100} = 0.\underline{0}\underline{3}$$

~~0.030~~

$$4) \underbrace{1,24\%}_{\text{comma}} = 0.0124$$

$$5) \underbrace{0,5\%}_{\text{comma}} = 0.005$$

$$6) \underbrace{1,82\%}_{\text{comma}} = 0.0182$$

\* Move dec. 2 places left (may need to add zeros)

### Dec. to %

$$1) 0.72 = \frac{72}{100} = 72\%$$

$$2) 0.23 = \frac{23}{100} = 23\%$$

$$3) 0.5 = \frac{5}{10} = \frac{50}{100} = 50\%$$

$$4) 0.257 = 25.7\%$$

$$5) 1.8 = 180\%$$

$$0.72 = 72\%$$

$$0.23 = 23\%$$

$$0.5 = 50\%$$

\* Move dec. 2 places  
to rgt. + put %

## Decimals to Fractions

$$1) 0.8 = \frac{8}{10} = \boxed{\frac{4}{5}}$$

$$2) 0.28 = \frac{28}{100} = \boxed{\frac{7}{25}}$$

2		28		100
2		14		50
		7		25

$$3) 15.125 = 15 \frac{125}{1000} = \boxed{15 \frac{1}{8}}$$

5		125		1000
5		25		200
5		5		40
		1		8

$$4) 0.6 = \frac{6}{10} = \boxed{\frac{3}{5}}$$

$$5) 1.75 = 1 \frac{75}{100} = \boxed{1 \frac{3}{4}}$$

## Fractions to decimals

(Short way)

$$1) \frac{17}{20} = \frac{85}{100} = 0.\underline{8}\underline{5}$$

$$2) 8 \frac{37}{50} = 8 \frac{74}{100} = 8.\underline{7}\underline{4}$$

Long way (works all of the time)

$$1) \frac{1}{8} = \boxed{0.125}$$

$$\begin{array}{r} 0.125 \\ 8 \overline{) 1.000} \\ \underline{-0} \phantom{0} \phantom{0} \phantom{0} \\ 10 \phantom{0} \phantom{0} \phantom{0} \\ \underline{-8} \phantom{0} \phantom{0} \phantom{0} \\ 20 \phantom{0} \phantom{0} \phantom{0} \\ \underline{-16} \phantom{0} \phantom{0} \phantom{0} \\ 40 \phantom{0} \phantom{0} \phantom{0} \\ \underline{-40} \phantom{0} \phantom{0} \phantom{0} \\ 0 \phantom{0} \phantom{0} \phantom{0} \end{array}$$

$$2) 3 \frac{24}{25} = 3 \frac{96}{100} = \boxed{3.96}$$

$$3) 5 \frac{11}{16} = \boxed{5.6875}$$

$$11 \div 16$$

$$\begin{array}{r} 00.6875 \\ 16 \overline{) 11.0000} \\ \underline{-96} \phantom{00} \phantom{00} \phantom{00} \\ 140 \phantom{00} \phantom{00} \phantom{00} \\ \underline{-128} \phantom{00} \phantom{00} \phantom{00} \\ 120 \phantom{00} \phantom{00} \phantom{00} \\ \underline{-112} \phantom{00} \phantom{00} \phantom{00} \\ 80 \phantom{00} \phantom{00} \phantom{00} \\ \underline{-80} \phantom{00} \phantom{00} \phantom{00} \\ 0 \phantom{00} \phantom{00} \phantom{00} \end{array}$$

Terminating  
Decimal  
(STOPS)

$$4) \quad \overline{0.333}$$

Bar notation →  
shows what repeats

$$1 \div 3$$

$$\begin{array}{r} 0.333 \\ 3 \overline{) 1.000} \\ \underline{-9} \phantom{0} \\ 10 \phantom{0} \\ \underline{-9} \phantom{0} \\ 10 \\ \underline{-9} \\ 1 \end{array}$$

Repeating  
dec. (doesn't  
terminate +  
see pattern)

$$5) \frac{5}{11} = 0.\overline{45}$$

$$\begin{array}{r}
 0.45454 \\
 11 \overline{) 5.00000} \\
 \underline{-44} \phantom{00000} \\
 60 \phantom{00000} \\
 \underline{-55} \phantom{00000} \\
 50 \phantom{00000} \\
 \underline{-44} \phantom{00000} \\
 60 \phantom{00000} \\
 \underline{-55} \phantom{00000} \\
 50 \phantom{00000} \\
 \underline{-44} \phantom{00000} \\
 6
 \end{array}$$

$$6) \frac{1}{6} = 6.\overline{083}$$

$$1 \div 12$$

$$\begin{array}{r}
 0.0833 \\
 12 \overline{) 1.00000} \\
 \underline{-96} \phantom{00000} \\
 40 \phantom{00000} \\
 \underline{-36} \phantom{00000} \\
 40 \phantom{00000} \\
 \underline{-36} \phantom{00000} \\
 4
 \end{array}$$