

Percents

Percents - A fraction with a denominator of 100.

(A ratio whose second term is 100)

$$\text{Ex) } 45\% = \frac{45}{100} = \frac{9}{20}$$

How to write a percent as a fraction:

- 1) Write the percent over 100
- 2) Reduce the fraction

How to write a fraction as a percent:

method 1:

- 1) multiply the bottom number by whatever number will turn it into a 100.

- 2) multiply the numerator by the same number

$$\text{Ex) } \frac{9}{20} \rightarrow \frac{9 \cdot 5}{20 \cdot 5} = \frac{45}{100} = 45\%$$

method 2:

- 1) divide the numerator by the denominator.

- 2) move the decimal of the quotient two places to the right (multiply by 100)

$$\text{ex) } \frac{3}{8} \rightarrow \begin{array}{r} 0.375 \\ 8 \overline{) 3.0} \\ \underline{-24} \\ 60 \\ \underline{-56} \\ 40 \end{array} \rightarrow 0.375 = 37.5\%$$

Note - Always make mixed numbers improper fractions before you begin

Finding a percent of a number:

- 1) Change the percent to a fraction
- 2) multiply the fraction by the number
- 3) Reduce the product

Ex) What is 20% of 6?

$$\frac{20}{100} \cdot 6 = \frac{120}{100} = \frac{12}{10} = \frac{6}{5} = 1\frac{1}{5}$$

Ex) $\frac{1}{2}\%$ of 70 is what number?

$$\frac{\frac{1}{2}}{100} \cdot 70 = \left(\frac{1}{2} \div 100\right) \cdot 70 =$$

$$\left(\frac{1}{2} \cdot \frac{1}{100}\right) \cdot 70 = \frac{1}{200} \cdot 70 = \frac{70}{200} = \left(\frac{7}{20}\right)$$

Finding a ~~percent~~ number from a percent and a number:

- 1) Divide the number by the percent
- 2) multiply the quotient by 100

Ex) 20% of a number is 16. What is the number.

$$\frac{16}{20} \cdot 100 = \frac{1600}{20} = \frac{160}{2} = (80)$$

$$* \frac{20}{100} \cdot x = 16, \text{ solve for } x.$$

Finding what percent one number is of another number: (what percent of x is y)

- 1) Divide y by x
- 2) multiply by 100% .

Ex) What percent of 70 is 14

$$\frac{14}{70} \times 100\% = \frac{1400\%}{70} = 20\%$$

$$* \quad wp \cdot 70 = 14$$

$$\frac{wp}{100} \cdot 70 = 14$$

$$\frac{70wp}{100} = 14$$

$$70wp = 1400$$

$$wp = \frac{1400}{70}$$

$$wp = 20$$

$$\therefore \boxed{20\%}$$