Percent (%)

- A percent is a ration or fraction whose denominator is 100
  - Example:
    - $5\% = \frac{5}{100} = 0.05$

    - $7.5\% = \frac{7.5}{100} = 0.075$

    - $100\% = \frac{100}{100} = 1$

    - $254\% = \frac{254}{100} = 2.54$

    - $0\% = \frac{0}{100} = 0$

    - $-86\% = \frac{-86}{100} = -0.86$

> **English – to – Math Dictionary**
> - " $\square$ percent" means $\dfrac{\square}{100}$
> - **of** means "*multiply*"
> - **is** means "*equal to*"
> - **what** means "x"

  - **Example:** Frances Cosgrove receives $1,850 per month as a salary. Her rent is $555 per month. What percent of her salary is spent on rent?
    - $\dfrac{1850x}{100} = 555$

    - $\dfrac{1850x \div 10}{100 \div 10} = 555 \rightarrow \dfrac{185 \div 5}{10 \div 5} = 555 \rightarrow \dfrac{37x}{2} = \dfrac{555}{1}$ cross multiply

    $\dfrac{37x}{37} = \dfrac{555(2)}{37} \rightarrow 2(15) = \textbf{\textit{30\%}}$ **She spends 30% of her salary on rent**

1. 12% of what number is equal to 6?
   - $\dfrac{12 \div 4}{100 \div 4}$ x = 6 $\rightarrow \dfrac{3}{25} = \dfrac{6}{1} \rightarrow \dfrac{25(6)}{3} = 25(2) = \boxed{50}$

2. 75% of $300 is how many dollars? $225

   - $\frac{75}{100} x \cdot 300 = x \rightarrow 75(3) = x \rightarrow 225 = x$

3. If your dinner bill is $50 and you plan to leave a 18% tip, how much tip do you leave? $9

   - $x = \frac{18}{100\,(2)} \cdot \cancel{50} = 9$
   - **TIP** = *Percentage · Bill*

4. What percent of 200 is 13? $\frac{13}{2}\% = 6.5\%$

   - $\frac{x}{100} \cdot 200 = 13 \rightarrow \frac{2x}{2} = \frac{13}{2} = 6.5$

Percent Change Formula: Percent change = $\dfrac{New\ Value - Original\ value}{Original\ Value} \cdot 100$

- The answer is always given as a percentage (___%)
- A positive answer indicates a *percent increase* ↑
- A negative answer indicates a *percent decrease* ↓
- Example: Florida teachers received a $1250 raise this year. If Will's salary last year was $25,000 what percent raise did he receive?
  - Original salary: $25,000
  - New salary: $26,250
  - PC = $\dfrac{26,250 - 25,000}{25,000} \cdot 100$