Percent's Cheat Sheet

Percent is a ratio out of 100.

Example 1: 43 out of 100 = $\frac{43}{100}$ = 0.43 or 43%

Example 2: 7 out of 100 = $\frac{7}{100}$ = 0.07 or 7%

Writing a percent as a decimal:

1. Divide percent by 100
   Example 1: 68% = $68 \div 100 = 0.68$
   Example 2: 162% = $162 \div 100 = 1.62$

Writing a decimal as a percent:

1. Multiply decimal by 100
   Example: $0.41 = 0.41 \times 100 = 41\%$

Writing a percent as a fraction:

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

Example 1: $76\% = \frac{76}{100} = \frac{19}{25}$

divide both by 4

lowest terms

Example 2: $15.5\% = \frac{15.5}{100} = \frac{155}{1000} = \frac{31}{200}$

Multiply by 10 to get rid of decimal

Divide by 5 to bring to the lowest terms

Example 3: $33\frac{1}{3}\% = \frac{33\frac{1}{3}}{100} = \frac{\frac{100}{3}}{100} = \frac{100}{3} \div 100 = \frac{100}{3} \div \frac{100}{1} = \frac{100}{3} \times \frac{1}{100} = \frac{100}{300} = \frac{1}{3}$

Writing fractions as a percent:

1. Divide top number by bottom number.
2. Multiply by 100
   Example: $\frac{5}{8} = 5 \div 8 = 0.625 \times 100 = 62.5\%$

   OR

1. Write as a proportion
   Example: $\frac{5}{8} = \frac{P}{100} \longrightarrow 8 \times P = 5 \times 100 \longrightarrow \frac{8P}{8} = \frac{500}{8} \longrightarrow P = 62.5$

Percent Equation

$$\frac{Part}{Whole} = \frac{\%}{100}$$

1. Fill in what you know and identify unknown
2. Multiply
3. Divide

Example: Part = 15, whole =60

$$\frac{15}{60} = \frac{P}{100} \longrightarrow 15 \times 100 = 60 \times P \longrightarrow \frac{1500}{60} = \frac{\cancel{60}P}{\cancel{60}} \longrightarrow P = 25$$

Simple Interest

$$I = p \times r \times t$$

p = principle
r = rate (% as decimal)
t = time (years)

Example 1: Principle = $4200
Rate = 4%
Time = 3 and a half years

$$I = 4200 \times 0.04 \times 3.5$$
$$I = \$588$$

Total amount due = Principle amount + interest
= $4200 + $588
= $4788.^{00}

Example 2: Principal = $3800
Rate = 6.5%
Time = 7 months

$$I = p \times r \times t$$
$$= 3800 \times 6.5\% \times \frac{7}{12} \quad \text{(divide)}$$
$$= 3800 \times 0.065 \times 0.5833333$$
$$= \$144.08$$

Finding Percent of Increase or Decrease

use percent equation

Increase:

1. Subtract (new-original)
2. Use difference as the part
3. Use the original amount as the whole
4. Multiply by 100

Example: You had 5 eggs but now have 8 eggs. What is your percent increase?

Subtract original from the new

$8 - 5 = 3$

Use difference as the part

$\frac{3}{5} = 0.6 \times 100 = 60\%$

Use original amount as the whole

Multiply by 100

Decrease:

1. Subtract (original – new)
2. Use difference as the part
3. Use the original amount as the whole
4. Multiply by 100

Example: You had 8 eggs but now have 5 eggs. What is your percent decrease?

Subtract new from the original

$8 - 5 = 3$

Use difference as the part

$\frac{3}{8} = 0.375 \times 100 = 37.5\%$

Use original amount as the whole

Multiply by 100

Finding Sale Price

use percent equation

1. Sale price is part
2. Original price is whole
3. Multiply by 100
4. % of sale is percent

Example: An item is on sale for $4.99, original price is $5.50, find the sale percent

$\frac{4.99}{5.50} = \frac{P}{100} \longrightarrow \frac{4.99}{5.50} = 0.907 \times 100 = 90.7\%$ ← Sale price is 90.7% of the original price

$100 - 90.7 = 9.3\%$ ←

If you subtract from 100, this gives you the actual discount as a percentage. In this case, the item is on sale for 9.3% off.

Finding Rate of Commission or Commission Amount

use percent equation

1. Part is amount of commission
2. Whole is total sale price
3. Percent is rate of commission

Example: A salesperson earns $750 for selling $5000 worth of furniture. What is the rate of commission?

$$\frac{750}{5000} = \frac{P}{100} \longrightarrow 750 \times 100 = 5000P \longrightarrow \frac{75{,}000}{5000} = \frac{5000P}{5000} \longrightarrow P = 15\%$$