

## Sec. 2.9 Percents

## The Percent Proportion

" $\boxed{a}$  is  $P$  percent of  $\boxed{b}$ "  
 $\downarrow$  part  $\downarrow$  base = whole

$\frac{\text{part}}{\text{whole}} = \frac{\text{is}}{\text{of}} \rightarrow \boxed{\frac{a}{b} = \frac{P}{100}}$

Problem 1:

a. What percent <sup>P</sup> of 90 is 63?

$$\frac{\text{part (is)}}{\text{whole (of)}} = \frac{\text{percent}}{100}$$

$$\frac{63}{90} = \frac{P}{100}$$

$$\frac{90P}{90} = \frac{6300}{90} \quad P = 70$$

$$\boxed{70\%}$$

b. What percent <sub>P</sub> of 56 is 42?  
 $\downarrow$  whole

$$\frac{P}{100} = \frac{42}{56}$$

$$\frac{56P}{56} = \frac{4200}{56}$$

$$P = 75$$

$$75\%$$

The Percent Equation

$$a = p\% \cdot b \quad \left( \frac{a}{b} = p\% \right)$$

Problem 2:

what percent of 90 is 76.5?

$$p \cdot 90 = 76.5$$

$$\frac{p}{100} = \frac{76.5}{90} \quad \frac{90p}{90} = \frac{76.5}{90}$$

$$\frac{90p}{90} = \frac{7650}{90} \quad p = 0.85$$

$$p = 85 \rightarrow 85\%$$

Problem 3:

30% of what number is 12.5?

$$\frac{30}{100} = \frac{12.5}{x}$$

$$\frac{30x}{30} = \frac{1250}{30}$$

$$x = 41.\bar{6} \text{ or } 41\frac{2}{3}$$

$$\frac{.30 \cdot x}{.30} = \frac{12.5}{.30}$$

$$x = 41.\bar{6} \text{ or } 41\frac{2}{3}$$

Problem 4:

A sweater normally costs \$49.99 but is on sale for 25% off.

What is the sale price?

$$\frac{25}{100} = \frac{x}{49.99}$$

$$x = 12.4975$$

$$\begin{array}{r} \text{Original} - \% \cdot \text{original} \\ \$49.99 - .25(49.99) \\ 49.99 - 12.4975 \\ \hline \$37.49 \end{array}$$

Problem 5:  $I = Prt$

P - principal  
r - rate  
t - time, yrs  
I - interest, decimal

a. You deposit \$500 into a savings account that earns a simple interest rate of 5% per year. You want to keep the money in the account for 5 years. How much interest will you earn? Check your answer for reasonableness.

$$I = Prt$$

$$I = 500(0.05)(5)$$

$$I = \$125$$

b. \$1200 at a rate of 3% for 3 years

$$I = 1200(.03)(3)$$

$$= 36(3)$$

$$= \$108$$

P4 b:

A tennis racket normally sells for \$65, but is 40% off. What is the sale price?

$$\$65 (.40) = \$26.00$$

$$\$65 - \$26$$

$$\boxed{\$39}$$

c. Milk usually costs \$3.50 a gallon, but prices just increased by 15%. What is the new price?

$$\$3.50 (0.15) = 0.525$$

$$\begin{array}{r} 3.50 \\ +0.525 \\ \hline 4.025 \end{array} \rightarrow \$4.03$$