NOTES 8.1: RATIOS & PROPORTIONS WITH APPLICATIONS

Objective: I can set up ratios & proportions to solve problems.

If $\frac{a}{b} = \frac{c}{d}$, then $ad = bc$ * Cross Multiply

EXAMPLE 1: Determine whether each pair of ratios forms a proportion.

a) $\frac{4}{6}, \frac{12}{16}$ Does $\frac{4}{6} = \frac{12}{16}$?

$64 \neq 72$ No

b) $\frac{3}{5}, \frac{6}{10}$ Does $\frac{3}{5} = \frac{6}{10}$?

$30 = 30$ Yes

EXAMPLE 2: Solve each of the following proportions.

a) $\frac{3}{x} = \frac{5}{(x+6)}$

$3(x+6) = 5x$
$3x+18 = 5x$
$18 = 2x$
$9 = x$

b) $\frac{(x-2)}{2} = \frac{(x+6)}{4}$

$4(x-2) = 2(x+6)$
$4x-8 = 2x+12$
$2x = 20$
$x = 10$

You can solve many problems that involve equal ratios/rates by using proportions.

EXAMPLE 3: Solve using a proportion.

a) Josefina sells helium balloons. She charges $9 for 12 balloons. At this rate, what would she charge for 50 balloons?

$\frac{\$}{\text{balloons}}$ $\frac{9}{12} = \frac{x}{50}$ $12x = 450$, $x = 37.5$ $37.50

b) A photocopy machine copied 50 pages in 1.5 minutes. At this rate, how long will the machine take to copy 90 pages?

$\frac{\text{Pages}}{\text{mins}}$ $\frac{50}{1.5} = \frac{90}{x}$ $50x = 135$, $x = 2.7$ 2.7 mins

c) A recent school bond issue passed with 3 out of every 4 votes in favor of the bond. A total of 2550 people voted against the bond. How many people voted in favor of the bond?

$\frac{\text{voted for}}{\text{voted against}}$ $\frac{3}{1} = \frac{x}{2550}$ $x = 7650$

7650 people