Proportions Review Sheet

Proportion Facts:

Proportions are an equation that has one ratio (fraction) on each side

$$\frac{a}{b} = \frac{c}{d}$$

To solve proportions we cross-multiply

$$\frac{a}{b} = \frac{c}{d} \rightarrow ad = bc \rightarrow d = \frac{bc}{a}$$

Common mistakes in cross-multiplying is when one of the fractions contain a + or – sign: we forget to use the distribution property

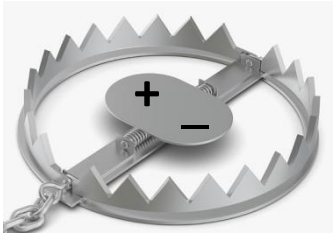
RIGHT

$$\frac{3}{x} = \frac{2}{x-2}$$

$$3(x-2) = 2x$$

$$3x - 6 = 2x$$

$$x = 6$$



WRONG

$$\frac{3}{x} = \frac{2}{x-2}$$

$$3x-2 = 2x \quad \text{(error)}$$

$$3x - 2 = 2x$$

$$x \neq 2$$

Lots of word problems can be solved using proportions (or proportional reasoning). These can be geometry problems (example 1) or distance (rate × time) problems (example 2) or "buying" problems (example 3)

Example 1: ***If Jon's shadow is 4 feet long (and he is 6 feet tall) and the telephone poll's shadow is 20 feet long, how tall is the telephone poll?***

$$\frac{4}{6} = \frac{20}{h} \rightarrow 4h = 120 \rightarrow h = 30 \text{ ft}$$

Example 2: ***Lynne made a trip to town and back. The trip there took three hours and the trip back took four hours. She averaged 6 km/hr on the return trip. Find the average speed of the trip there.***

$$d = r \times t \rightarrow d = 3x = 4 \times 6 \rightarrow 3x = 24 \rightarrow x = 8 \text{ km/hr}$$

Example 3: ***If you can buy one can of pineapple chunks for $2 then how many can you buy with $10?***

$$\frac{1}{2} = \frac{x}{10} \rightarrow 2x = 10 \rightarrow x = 5 \text{ cans}$$

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Solving Proportions

Date_____ Period__

Solve each proportion.

1) $\frac{10}{8} = \frac{n}{10}$

10(10) = 8n
100 = 8n
12.5 = n

2) $\frac{7}{5} = \frac{x}{3}$

3) $\frac{9}{6} = \frac{x}{10}$

4) $\frac{7}{n} = \frac{8}{7}$

5) $\frac{4}{3} = \frac{8}{x}$

6) $\frac{7}{b+5} = \frac{10}{5}$

10(b + 5) = 35
10b + 50 = 35
10b = -15
b = -1.5

7) $\frac{6}{b-1} = \frac{9}{7}$

8) $\frac{4}{m-8} = \frac{8}{2}$

9) $\frac{5}{6} = \frac{7n+9}{9}$

10) $\frac{4}{9} = \frac{r-3}{6}$

11) $\frac{7}{9} = \frac{b}{b-10}$

12) $\frac{9}{k-7} = \frac{6}{k}$

13) $\frac{4}{n+2} = \frac{7}{n}$

14) $\frac{n}{n-3} = \frac{2}{3}$

15) $\frac{x-3}{x} = \frac{9}{10}$

16) $\frac{5}{r-9} = \frac{8}{r+5}$

5(r + 5) = 8(r – 9)
5r + 25 = 8r – 72
97 = 3r
32.3 = r

17) $\frac{p+10}{p-7} = \frac{8}{9}$

18) $\frac{2}{8} = \frac{n+4}{n-4}$

19) $\frac{n-5}{n+8} = \frac{2}{7}$

20) $\frac{n-6}{n-7} = \frac{9}{2}$