

1-25-18

Aim: SWBAT solve word problems with proportions.

HW: Packet Page 12

Quiz tomorrow

Do Now: Packet Page 8 # 4 - 7

Ratios and Proportions  
HOMEWORK

7R: Textbook Pg. 351 # 8 - 11, 16 - 23, 29 - 31 & Word Problems WS # 1 - 3

7A: Textbook Pg. 351 # 8 - 11, 16 - 23, 29 - 34 & Word Problems WS # 1 - 3

⑧  $\frac{3}{4} \stackrel{?}{=} \frac{6}{8}$   
 $4 \cdot 6 \stackrel{?}{=} 3 \cdot 8$   
 $24 = 24$   
 YES

⑨  $\frac{1}{2} \stackrel{?}{=} \frac{2}{5}$   
 $1 \cdot 5 \stackrel{?}{=} 2 \cdot 2$   
 $5 \neq 4$   
 NO

⑩  $\frac{14}{21} \stackrel{?}{=} \frac{26}{39}$   
 $21 \cdot 26 \stackrel{?}{=} 14 \cdot 39$   
 $546 = 546$   
 YES

⑪  $\frac{15}{45} \stackrel{?}{=} \frac{45}{135}$   
 $15 \cdot 135 \stackrel{?}{=} 45 \cdot 45$   
 $2025 = 2025$   
 YES

⑫  $\frac{17}{12} = \frac{k}{36}$   
 $\frac{12k}{12} = \frac{612}{12}$   
 $k = 51$

⑬  $\frac{2}{5} = \frac{c}{20}$   
 $\frac{2c}{5} = \frac{40}{5}$   
 $c = 8$

⑭  $\frac{7.2}{m} = \frac{2.4}{1.8}$   
 $\frac{24m}{2.4} = \frac{12.96}{2.4}$   
 $m = 5.4$

⑮  $\frac{256}{9.6} = \frac{1.6}{g}$   
 $\frac{256g}{256} = \frac{15.36}{256}$   
 $g = 0.06$

⑯  $\frac{67.2}{g} = \frac{16.8}{3.3}$   
 $\frac{16.8g}{16.8} = \frac{221.76}{16.8}$   
 $g = 13.2$

⑰  $\frac{t}{29.4} = \frac{5.5}{4.2}$   
 $\frac{4.2t}{4.2} = \frac{161.7}{4.2}$   
 $t = 38.5$

⑱  $\frac{p}{5.4} = \frac{485}{18.9}$   
 $\frac{18.9p}{18.9} = \frac{2608.2}{18.9}$   
 $p = 138$

⑳  $\frac{712}{8.8} = \frac{x}{18.7}$   
 $\frac{8.8x}{8.8} = \frac{13314.4}{8.8}$   
 $x = 1513$

㉑  $\frac{2}{x+2} = \frac{18}{27}$   
 $18(x+2) = 54$   
 $18x + 36 = 54$   
 $-36 -36$   
 $\frac{18x}{18} = \frac{18}{18}$   
 $x = 1$

㉒  $\frac{x-2}{8} = \frac{30}{40}$   
 $40(x-2) = 240$   
 $40x - 80 = 240$   
 $+80 +80$   
 $\frac{40x}{40} = \frac{320}{40}$   
 $x = 8$

㉓  $\frac{9}{5} = \frac{36}{x-3}$   
 $9(x-3) = 180$   
 $9x - 27 = 180$   
 $+27 +27$   
 $\frac{9x}{9} = \frac{207}{9}$   
 $x = 23$

㉔  $\frac{5}{x} = \frac{7}{x+4}$   
 $7x = 5(x+4)$   
 $7x = 5x + 20$   
 $-5x -5x$   
 $\frac{2x}{2} = \frac{20}{2}$   
 $x = 10$

㉕  $\frac{x}{5} = \frac{3x-4}{7}$   
 $5(3x-4) = 7x$   
 $15x - 20 = 7x$   
 $-15x -15x$   
 $\frac{-20}{-8} = \frac{-8x}{-8}$   
 $\frac{5}{2} = x$

㉖  $\frac{3-5x}{4} = \frac{x+5}{9}$   
 $9(3-5x) = 4(x+5)$   
 $27 - 45x = 4x + 20$   
 $+45x +45x$   
 $\frac{27}{-20} = \frac{49x + 20}{-20}$   
 $\frac{7}{-20} = \frac{49x}{-20}$   
 $\frac{1}{7} = x$

## Ratios and Proportions

Solve algebraically using a proportion. Write your answer in a complete sentence.

1. If 2 liters of fruit juice cost \$3.98, how much do 5 liters of the fruit juice cost?

$$\frac{\$3.98}{2L} = \frac{\$x}{5L} \quad \frac{2x}{2} = \frac{19.9}{2} \quad \text{It will cost } \$9.95 \text{ for 5 Liters.}$$

$$x = 9.95$$

2. If 64 feet of rope weighs 20 pounds, how much will 80 feet of the same rope weigh?

$$\frac{64 \text{ feet}}{20 \text{ pounds}} = \frac{80 \text{ feet}}{x \text{ pounds}} \quad \frac{64x}{64} = \frac{1600}{64} \quad \text{Eighty feet of rope weighs 25 pounds.}$$

$$x = 25$$

3. If a 10-pound turkey takes 4 hours to cook, how long will it take a 14-pound turkey to cook?

$$\frac{10 \text{ lbs}}{4 \text{ hrs}} = \frac{14 \text{ lbs}}{x \text{ hrs}} \quad \frac{10x}{10} = \frac{56}{10} \quad \text{A 14-lb turkey will cook in 5 hours 36 minutes.}$$

$$x = 5.6$$

4. In 5 hours of driving, Julie traveled 235 kilometers. If she travels at the same rate, how far will she drive in 11 hours?

$$\frac{235 \text{ km}}{5 \text{ hrs}} = \frac{x \text{ km}}{11 \text{ hrs}} \quad \frac{5x}{5} = \frac{2585}{5} \quad \text{She will drive 517 km.}$$

$$x = 517$$

5. Martha read 12 books in the last 8 weeks. At this rate, how many books will she read in 18 weeks?

$$\frac{12 \text{ books}}{8 \text{ weeks}} = \frac{x \text{ books}}{18 \text{ weeks}} \quad \frac{8x}{8} = \frac{216}{8} \quad \text{Martha will read 27 books in 18 weeks.}$$

$$x = 27$$

6. Pablo typed 410 words in 5 minutes. How many words per minute did he type?

$$\frac{410 \text{ words}}{5 \text{ min}} = \frac{x \text{ words}}{1 \text{ min}} \quad \frac{5x}{5} = \frac{410}{5} \quad \text{He can type 82 words per minute.}$$

$$x = 82$$

7. Evan paid \$1.12 for a dozen eggs. Determine the cost of 3 eggs.

$$\frac{\$1.12}{12 \text{ eggs}} = \frac{\$x}{3 \text{ eggs}} \quad \frac{12x}{12} = \frac{3.36}{12} \quad \text{It will cost } \$0.28 \text{ for 3 eggs.}$$

$$x = 0.28$$

Aim: SWBAT solve proportional word problems.

More Word Problems: Let's investigate the concept of Part/ Part/ Whole . . .

The easiest way to look at this new type of word problem is to use an example. Consider the word problem below:

The ratio of sixth grade students in a local school who wear glasses to those students who do not is 2:7. If the total number of sixth grade students in the school is 180, how many students in sixth grade wear glasses?

In the diagram below, W represents Wears Glasses and N represents Does Not wear glasses. Given the ratio 2:7, that means that for every 2 students that wear glasses, there are 7 students who do not wear glasses. ( $2 + 7 = 9 \rightarrow$  This means that 2 out of 9 students wear glasses and 7 out of 9 students do not wear glasses.)

W	W	N	N	N	N	N	N	N	Part Part Whole
2x		7x							
180 Total Students									

$2x$  and  $7x$  are the two parts and together their sum is 180.

So we can write the equation:  $2x + 7x = 180$

We solve the equation and get  $x = 20$

So 40 sixth grade students wear glasses and 140 do not wear glasses.

(Check  $\rightarrow 40 + 140 = 180$ )

$$\begin{aligned}
 2x + 7x &= 180 \\
 9x &= \frac{180}{9} \\
 x &= 20
 \end{aligned}$$

$$\begin{aligned}
 2x \\
 2 \cdot 20 \\
 40
 \end{aligned}$$

Examples:

Assume all situations are proportional. Solve each using a proportion. Show your work algebraically. Your final answer should answer the question and be in a complete sentence.

- 1) A father is 4 times older than his son. The sum of their ages is 50. How old is each?

S	F	F	F	F
x	4x			
50 Years				

$$\begin{aligned}
 x + 4x &= 50 \\
 5x &= 50 \\
 x &= \frac{50}{5} \\
 x &= 10
 \end{aligned}$$

$$\begin{aligned}
 4x \\
 4 \cdot 10 \\
 40
 \end{aligned}$$

The son is 10 years old and the father is 40 years old.

4) In your gym class, the ratio of girls to boys is 2:3. If there are 65 students in your gym class, how many of them are girls?

5) The ratio of green marbles to yellow marbles is 4:7. If there are 253 marbles in the collection, how many of each color are there?

6) John found out that the ratio of green M&M's to red M&M's in a 5 pound bag is 2:5. If there are 595 M&M's in a 5 pound bag, how many of them would you expect to be green?