

Using rates and ratios to set up proportions

Example 1: At Sprayberry high school there is a ratio of 30 students to every teacher. If Sprayberry has 1,920 students, how many teachers must be hired to maintain that ratio?

$$\frac{30 \text{ STUDENTS}}{1 \text{ TEACHER}} = \frac{1,920 \text{ STUDENTS}}{x \text{ TEACHERS}}$$

WHEN SETTING TWO RATIOS EQUAL WE CAN SOLVE USING CROSS MULTIPLY

$$30 \cdot x = 1 \cdot 1920$$

$$\frac{30x}{30} = \frac{1920}{30}$$

$$x = 64$$

WE NEED TO HIRE 64 TEACHERS



Example 2: In a bag of Halloween candy there are 10 kit kats for every 4 reese's cups. If the bag you bought contained 50 kit kats, how many reese's cups would you expect to find?



$$\frac{10 \text{ KIT KATS}}{4 \text{ REESE'S}} = \frac{50 \text{ KIT KATS}}{x \text{ REESE'S}}$$

SO

$$10 \cdot x = 4 \cdot 50$$

$$\frac{10x}{10} = \frac{200}{10}$$

$$x = 20$$

WE WOULD EXPECT 20 REESE CUPS

Example 3: Rita is making necklaces to sell at a local craft fair. She determined that she can make 12 pairs of earrings in 2 hours, how many pairs of earrings can she make in three hours?

$$\frac{12 \text{ EARRINGS}}{2 \text{ HOURS}} = \frac{x \text{ EARRINGS}}{3 \text{ HOURS}}$$

x = EARRINGS

$$12 \cdot 3 = 2 \cdot x$$

$$\frac{36}{2} = \frac{2x}{2}$$

$$18 = x$$



18 PAIRS OF EARRINGS

Example 4: Marlene is planning a trip. She knows that her car gets 38 miles to the gallon on the highway. If her trip is going to be 274 miles and one gallon of gas is \$2.30, how much should she expect to pay for gas?

x = HOW MANY GALLONS?

THIS IS OUR RATIO



$$\frac{38 \text{ MILES}}{1 \text{ GALLON}} = \frac{274 \text{ MILES}}{x \text{ GALLONS}}$$

$$38 \cdot x = 1 \cdot 274$$

$$\frac{38x}{38} = \frac{274}{38}$$

$$x = 7.2 \text{ GALLONS}$$

SO 7.2 GALLONS
AT \$2.30 PER GALLON IS
 $7.2 \cdot \$2.30 = \16.56

Example 5: For every three boys at soccer camp, there are two girls. If there are 20 children at soccer camp, how many are girls?

Hmm... THIS IS HARD TO SET UP AS A PROPORTION... LETS TRY DRAWING IT

$$\begin{array}{l} (3) \text{ BBB} \\ (2) \text{ GG} \end{array} + \begin{array}{l} \text{BBB} \\ \text{GG} \end{array} + \begin{array}{l} \text{BBB} \\ \text{GG} \end{array} + \begin{array}{l} \text{BBB} \\ \text{GG} \end{array} = \frac{12 \text{ BOYS}}{8 \text{ GIRLS}}$$

5 TOTAL PLAYERS 10 TOTAL PLAYERS 15 TOTAL PLAYERS 20 TOTAL PLAYERS

LOOK! IT IS STILL A 3 TO 2 RATIO BUT THE TOTAL IS NOW 20 PLAYERS!

