

Warm-up

Solve each equation.

1. $10x - 7 = 4x + 5$

$$\begin{array}{r}
 10x - 7 = 4x + 5 \\
 -4x \quad -4x \\
 \hline
 6x - 7 = 5 \\
 +7 \quad +7 \\
 \hline
 6x = 12 \\
 \div 6 \quad \div 6 \\
 \hline
 x = 2
 \end{array}$$

2. $7(b + 3) = 7b - 4$

$$\begin{array}{r}
 7b + 21 = 7b - 4 \\
 -7b \quad -7b \\
 \hline
 21 = -4 \quad \text{no solution}
 \end{array}$$

Oct 13-9:43 PM

$$\begin{array}{r}
 \textcircled{24} \quad \frac{1}{2}(6x+8) = 3(x+3) \\
 3x+4 = 3x+9 \\
 \hline
 \end{array}$$

Oct 1-9:20 AM

2.5/2.6 Ratios and Solving Proportions

1.) Write ratios between two quantities.

2.) Solve proportions by using cross multiplying.

Oct 13-9:43 PM

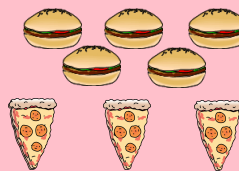
2.5/2.6 Ratios and Solving Proportions

Ratio: A ratio is a way of comparing amounts.

Can be written in three ways:

$$\text{a to b} \quad \text{a:b} \quad \left(\frac{a}{b}\right)$$

Each ratio is read "the ratio of a to b"



The ratio of pizza to hamburgers is 3:5.



The ratio of hamburgers to pizza is 5:3.

Oct 13-9:43 PM

2.5/2.6 Ratios and Solving Proportions

Example 1: Write a ratio.

A person makes 6 long distance calls and 15 local calls in 1 month.

a. Find the ratio of long distance calls to local calls

$$\frac{6}{15} \quad \text{6 to 15} \quad 6:15$$

b. Find the ratio of long distance calls to all calls

$$\frac{6}{21}$$

Oct 13-9:43 PM

2.5/2.6 Ratios and Solving Proportions

Proportions: An equation stating that two ratios are equal

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

Cross Products: In order for two ratios to be equal, their cross products have to be equal.Example: $\frac{a}{b} = \frac{c}{d}$ then $ad = cb$

$$\begin{array}{c}
 \textcircled{x} \quad \textcircled{75} \\
 \textcircled{7} \quad \textcircled{100} \\
 100x = 525
 \end{array}$$

Oct 13-9:43 PM

2.5/2.6 Ratios and Solving Proportions

Example 2: Solve each proportion.

a. $\frac{y}{15} = \frac{3}{5}$ b. $\frac{a}{25} = \frac{52}{100}$ c. $\frac{p}{6} = \frac{24}{36}$

Handwritten solutions:

- a. $y \cdot 5 = 15 \cdot 3$
 $5y = 45$
 $\frac{5y}{5} = \frac{45}{5}$
 $y = 9$
- b. $a \cdot 100 = 25 \cdot 52$
 $100a = 1300$
 $\frac{100a}{100} = \frac{1300}{100}$
 $a = 13$
- c. $3ap = 344$
 $\frac{3ap}{3a} = \frac{344}{3a}$
 $p = 4$

Oct 13-9:43 PM

2.5/2.6 Ratios and Solving Proportions

Example 3: Solve each proportion.

a. $\frac{6}{b} = \frac{3}{b-2}$ b. $\frac{5}{13} = \frac{k-4}{39}$

Handwritten solutions:

- a. $6(b-2) = b \cdot 3$
 $6b - 12 = 3b$
 $-12 = -3b$
 $\frac{-12}{-3} = \frac{-3b}{-3}$
 $b = 4$
- b. $5 \cdot 39 = 13(k-4)$
 $195 = 13k - 52$
 $52 = 13k - 52$
 $247 = 13k$
 $\frac{247}{13} = \frac{13k}{13}$
 $k = 19$

Oct 13-9:43 PM

2.5/2.6 Ratios and Solving Proportions

Example 4: Write the sentence as a proportion. Then solve the proportion.

a. x is to 4 as 8 is to 16

$$\frac{x}{4} = \frac{8}{16}$$

$$16x = 32$$

$$\frac{16x}{16} = \frac{32}{16}$$

$$x = 2$$

b. 4 is to 12 as n is to 3

$$\frac{4}{12} = \frac{n}{3}$$

$$12 = 12n$$

$$\frac{12}{12} = \frac{12n}{12}$$

$$n = 1$$

Oct 13-9:43 PM

2.5/2.6 Ratios and Solving Proportions

Example 5: Use a scale model.

An architect creates a scale model of a school. The school is 50 feet high. The ratio of the model to the actual school is 1 foot to 75 feet. Estimate the height of the model.

$$\frac{1}{75} = \frac{x}{50}$$

$$50 = 75x$$

$$\frac{50}{75} = \frac{75x}{75}$$

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

$$x = 0.67$$

Oct 13-9:43 PM

2.5/2.6 Ratios and Solving Proportions

Checkpoint: Solve the proportions.

1. $\frac{d}{60} = \frac{40}{50}$ 2. $\frac{a}{9a-2} = \frac{1}{8}$

Handwritten solutions:

- 1. $50d = 2400$
 $d = 48$
- 2. $8a = 1(9a-2)$
 $8a = 9a-2$
 $-9a = -9a-2$
 $-1 = -2$
 2

Oct 13-9:43 PM

2.5/2.6 Ratios and Solving Proportions

3. $\frac{6}{(4+2w)} = \frac{-2}{(w-10)}$ 4. Write the sentence as a proportion & solve

b is to 10 as 7 is to 2

Handwritten solutions:

- 3. $6(w-10) = -2(4+2w)$
 $6w - 60 = -8 - 4w$
 $4w = -60 - 8$
 $10w - 60 = -8$
 $10w = 52$
 $w = 5.2$
- 4. $\frac{b}{10} = \frac{7}{2}$
 $2b = 70$
 $b = 35$

Oct 13-9:43 PM