Bell Work

Solve each equation. Then, graph the solution set.

1. | 2x - 1 | = 7   2. | p + 6 | = -5

$$\frac{2}{5}x + 6 = \frac{2x}{3} + 10$$

Lesson 2.6 (Ratios and Proportions)

<u>**Objectives**</u>**:**
    -Compare ratios.
    -Solve proportions.

Ratio - comparison of 2 numbers by division

Ex. Ratio of x to y

$$x \text{ to } y \qquad x : y \qquad \frac{x}{y}$$

Proportion - an equation stating that 2 ratios are equal

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Equivalent Ratios

- use <u>cross multiplication</u> to verify

$$\frac{3}{4} \diagdown \diagup \frac{6}{8}$$

$$3 \times 8 = 6 \times 4$$

$$24 = 24 \longrightarrow \text{these fractions are equivalent}$$

Practice: Are the ratios equivalent?

1A. $\dfrac{6}{10}, \dfrac{2}{5}$ **1B.** $\dfrac{1}{6}, \dfrac{5}{30}$

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Solving Proportions - use cross multiplication

Ex. 1 $\dfrac{x-2}{14} = \dfrac{2}{7}$

$\dfrac{x-2}{14} = \dfrac{2}{7}$ Original proportion

$(x-2)7 = 14(2)$ Find the cross products.

$7x - 14 = 28$ Simplify.

$7x = 42$ Add 14 to each side.

$x = 6$ Divide each side by 7.

Ex. 2 $\dfrac{x}{10} = \dfrac{3}{5}$

$\dfrac{x}{10} = \dfrac{3}{5}$ Original proportion

$x(5) = 10(3)$ Find the cross products.

$5x = 30$ Simplify.

$\dfrac{5x}{5} = \dfrac{30}{5}$ Divide each side by 5.

$x = 6$ Simplify.

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Scale - a rate used to make a scale model of something much larger or smaller

MOUNTAIN TRAIL The Ramsey Cascades Trail is about $1\frac{1}{8}$ inches long on a map with scale 3 inches = 10 miles. What is the actual length of the trail?

Let ℓ represent the actual length.

scale $\longrightarrow$ $\dfrac{3}{10} = \dfrac{1\frac{1}{8}}{\ell}$ $\longleftarrow$ scale
actual $\longrightarrow$ $\longleftarrow$ actual

$$3(\ell) = 1\frac{1}{8}\,(10) \qquad \text{Find the cross products.}$$

$$3\ell = \frac{45}{4} \qquad \text{Simplify.}$$

$$3\ell \div 3 = \frac{45}{4} \div 3 \qquad \text{Divide each side by 3.}$$

$$\ell = \frac{15}{4} \text{ or } 3\frac{3}{4} \qquad \text{Simplify.}$$

The actual length is about $3\frac{3}{4}$ miles.

AIRPLANES On a model airplane, the scale is 5 centimeters = 2 meters. If the model's wingspan is 28.5 centimeters, what is the actual wingspan?

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