

Bell Ringer - Solve the equation.

$$\frac{4}{3}x + 14 = -30$$

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$$\quad -14 \quad -14$$

$$\frac{\cancel{3}}{\cancel{4}} \cdot \frac{\cancel{4}}{\cancel{3}} x = \frac{-44}{1} \cdot \frac{\cancel{3}}{\cancel{4}}$$

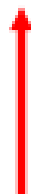
$$x = -33$$

Chapter 11-1 Ratio and Proportion Notes

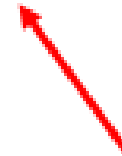
Ratio: a comparison of two quantities (numbers).

Proportion: an equation that states two ratios are equivalent.

$$\text{If } \frac{a}{b} = \frac{c}{d}, \text{ then } \frac{b}{a} = \frac{d}{c} \quad \text{and} \quad ad = bc$$



Reciprocals are equal.



Cross products are equal.

Extraneous Solution: a solution that does not work with the original problem. Examples are a negative length or a ratio that has a denominator of zero.

Solve the proportion and check for extraneous solutions. No decimal answers. Integers, fractions, or mixed numbers only.

$$1) \quad \frac{2}{3} = \frac{3}{w}$$

Solve the proportion and check for extraneous solutions. No decimal answers. Integers, fractions, or mixed numbers only.

1) $\frac{2}{3} = \frac{3}{w}$

$$2w = 9$$

$$w = \frac{9}{2} \text{ or } 4\frac{1}{2}$$

Solve the proportion and check for extraneous solutions. No decimal answers. Integers, fractions, or mixed numbers only.

$$2) \quad \frac{4}{r} = \frac{16}{5}$$

Solve the proportion and check for extraneous solutions. No decimal answers. Integers, fractions, or mixed numbers only.

$$2) \quad \frac{4}{r} = \frac{16}{5}$$

$$16r = 20$$

$$r = \frac{20}{16} = \frac{5}{4} \text{ or } 1\frac{1}{4}$$

Solve the proportion and check for extraneous solutions. No decimal answers. Integers, fractions, or mixed numbers only.

$$3) \frac{10}{x} = \frac{2x}{5}$$

Solve the proportion and check for extraneous solutions. No decimal answers. Integers, fractions, or mixed numbers only.

$$3) \frac{10}{x} = \frac{2x}{5}$$

$$2x^2 = 50$$

$$x^2 = 25$$

$$x = \pm 5$$

Solve the proportion and check for extraneous solutions. No decimal answers. Integers, fractions, or mixed numbers only.

$$4) \frac{-3}{x} = \frac{x-3}{2x}$$

Solve the proportion and check for extraneous solutions. No decimal answers. Integers, fractions, or mixed numbers only.

$$4) \frac{-3}{x} = \frac{x-3}{2x}$$

$$\begin{array}{rcl} -6x & = & x^2 - 3x \\ +6x & & +6x \end{array}$$

$$0 = x^2 + 3x$$

$$0 = x(x+3)$$

$$x = 0 \text{ and } -3$$

Note that 0 is an extraneous solution. Cannot have zero in the denominator of a fraction. Therefore, only -3 is a solution.

Solve the proportion and check for extraneous solutions. No decimal answers. Integers, fractions, or mixed numbers only.

$$5) \frac{x + 3}{x + 5} = \frac{x - 3}{-5}$$

Solve the proportion and check for extraneous solutions. No decimal answers. Integers, fractions, or mixed numbers only.

$$5) \frac{x+3}{x+5} = \frac{x-3}{-5}$$

$$(x+5)(x-3) = -5(x+3)$$

$$x^2 - 3x + 5x - 15 = -5x - 15$$

$$x^2 + 2x - 15 = -5x - 15$$

$$x^2 + 7x = 0$$

$$x(x+7) = 0$$

$$x = 0 \text{ and } -7$$

Both are solutions for this equation. Zero does not make the denominator zero in this case.