

## Lesson 8: Linear Equations in Disguise

### Classwork

#### Example 3

Can this equation be solved?

$$\frac{6+x}{7x+\frac{2}{3}} = \frac{3}{8}$$

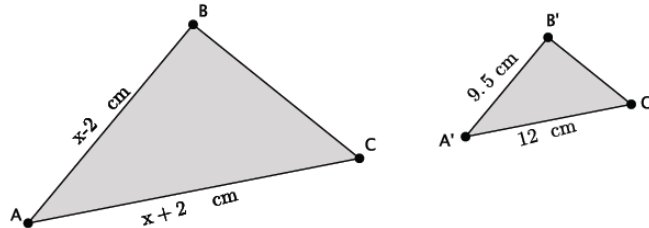
#### Example 4

Can this equation be solved?

$$\frac{7}{3x+9} = \frac{1}{8}$$

**Example 5**

In the diagram below,  $\triangle ABC \sim \triangle A'B'C'$ . Using what we know about similar triangles, we can determine the value of  $x$ .

**Exercises**

Solve the following equations of rational expressions, if possible.

1.  $\frac{2x+1}{9} = \frac{1-x}{6}$

$$2. \frac{5+2x}{3x-1} = \frac{6}{7}$$

$$3. \frac{x+9}{12} = \frac{-2x-\frac{1}{2}}{3}$$

$$4. \frac{8}{3-4x} = \frac{5}{2x+\frac{1}{4}}$$

**Lesson Summary**

Proportions are linear equations in disguise and are solved the same way we normally solve proportions.

When multiplying a fraction with more than one term in the numerator and/or denominator by a number, put the expressions with more than one term in parentheses so you remember to use the distributive property when transforming the equation. For example:

$$\frac{x + 4}{2x - 5} = \frac{3}{5}$$

$$5(x + 4) = 3(2x - 5)$$

The equation  $5(x + 4) = 3(2x - 5)$  is now clearly a linear equation and can be solved using the properties of equality.

**Problem Set**

Solve the following equations of rational expressions, if possible. If it cannot be solved, explain why.

1.  $\frac{5}{6x-2} = \frac{-1}{x+1}$

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

2.  $\frac{4-x}{8} = \frac{7x-1}{3}$

7.  $\frac{6x+1}{3} = \frac{9-x}{7}$

3.  $\frac{3x}{x+2} = \frac{5}{9}$

8.  $\frac{\frac{1}{3}x-8}{12} = \frac{-2-x}{15}$

4.  $\frac{\frac{1}{2}x+6}{3} = \frac{x-3}{2}$

9.  $\frac{3-x}{1-x} = \frac{3}{2}$

5.  $\frac{7-2x}{6} = \frac{x-5}{1}$

10. In the diagram below,  $\triangle ABC \sim \triangle A'B'C'$ . Determine the lengths of  $AC$  and  $BC$ .

