# Lesson 8: Linear Equations in Disguise

## Classwork

### Example 3

Can this equation be solved?

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

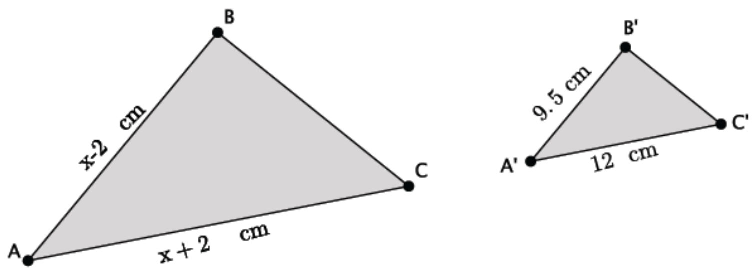
### Example 4

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

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

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

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

### Lesson Summary

Some 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 the equation cannot be solved, explain why.

1. $\frac{5}{6x-2}=\frac{-1}{x+1}$
2. $\frac{4-x}{8}=\frac{7x-1}{3}$
3. $\frac{3x}{x+2}=\frac{5}{9}$
4. $\frac{\frac{1}{2}x+6}{3}=\frac{x-3}{2}$
5. $\frac{7-2x}{6}=\frac{x-5}{1}$
6. $\frac{2x+5}{2}=\frac{3x-2}{6}$
7. $\frac{6x+1}{3}=\frac{9-x}{7}$
8. $\frac{\frac{1}{3}x-8}{12}=\frac{-2-x}{15}$
9. $\frac{3-x}{1-x}=\frac{3}{2}$
10. In the diagram below, $\triangle ABC \sim \triangle A'B'C'$. Determine the lengths of $AC$ and $BC$.