Unit 4 – Lesson 8

Linear Equations in Disguise

Name: _____

Date: _____ Period: _____

Student Outcomes

- Students rewrite and solve equations that are not obviously linear equations using properties of equality.

Some linear equations may not look like linear equations upon first glance.

A simple example that you should recognize is noted below. Solve the equation.

$$\frac{x}{5} = \frac{6}{12}.$$

Example 1.   Solve the given equation.

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

Example 2.   Given a linear equation in disguise, we will try to solve it. To do so, we must first assume that the following equation is true for some number x.

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

Example 3.   Solve the given equation.

$$\frac{\frac{1}{5} - x}{7} = \frac{2x + 9}{3}$$

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

Problem Set

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

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

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

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

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

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

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

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

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

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