

LESSON 8.3 Skills Practice

Name _____

Date _____

Problem Set

Solve each rational equation using cross multiplication. Describe any restrictions for the value of x . Check your answer(s) and identify any extraneous roots should they occur.

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

Restrictions: $x \neq -3, -1$

$$(x-1)(x+1) = (x+3)(x-2)$$

$$x^2 - 1 = x^2 + x - 6$$

$$-1 = x - 6$$

$$x = 5$$

Check $x = 5$.

$$\frac{5-1}{5+3} \stackrel{?}{=} \frac{5-2}{5+1}$$

$$\frac{4}{8} \stackrel{?}{=} \frac{3}{6}$$

$$\frac{1}{2} = \frac{1}{2} \quad \checkmark$$

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

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

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

6. $\frac{x+5}{x-4} = \frac{x+4}{x-5}$

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

Solve each rational equation by multiplying both sides of the equation by the least common denominator. Describe any restrictions for the value of x . Check your answer(s) and identify any extraneous roots should they occur.

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

Restriction: $x \neq 0$

$$2x^2 \left(\frac{2}{x} - \frac{3}{2x} \right) = 2x^2 \left(\frac{1}{x^2} \right)$$

$$4x - 3x = 2$$

$$x = 2$$

Check $x = 2$.

$$\frac{2}{2} - \frac{3}{2(2)} \stackrel{?}{=} \frac{1}{2^2}$$

$$1 - \frac{3}{4} \stackrel{?}{=} \frac{1}{4}$$

$$\frac{1}{4} = \frac{1}{4} \quad \checkmark$$

$$8. \frac{1}{x} + \frac{1}{x^2} = 2$$

$$10. \frac{2}{x+3} + \frac{6}{x^2+3x} = \frac{1}{x}$$

$$9. \frac{5}{2x-4} = \frac{15}{x^2-4}$$

$$11. \frac{2}{x^2-x} - \frac{1}{x-1} = 0$$

$$12. \frac{x}{x+2} + \frac{4x+6}{2x^2+5x+3} = \frac{x-1}{2x+4}$$