

Find CD Reciprocal of 2nd fraction Factor

7-5 Solving Rational Equations Notes

$$\frac{\text{Polynomial}}{\text{poly.}} = \frac{\text{Poly}}{\text{poly.}}$$

Solve each equation. Check your solutions.

1. $\frac{x \cdot \frac{1}{2} + \frac{2 \cdot 2}{2 \cdot x}}{\frac{1 \cdot 2}{x \cdot 2}}$

CD: $2x$

New Step: Multiply both sides by the CD

$$\frac{\cancel{2x} \cdot \frac{x+4}{\cancel{2x}}}{\cancel{2x} \cdot \frac{2}{\cancel{2x}}} = \frac{\cancel{2x} \cdot \frac{2}{\cancel{2x}}}{\cancel{2x} \cdot \frac{2}{\cancel{2x}}}$$

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

$$x+4 = 2$$

$$x = -2$$

2. $\frac{\frac{3 \cdot 4}{3} + \frac{7x \cdot 1}{7x \cdot 3}}{\frac{7 \cdot 7}{3x \cdot 7}}$

CD: $21x$

New Step: Mult. both sides by the CD

$$\frac{\cancel{21x} \cdot \frac{12 + 7x}{\cancel{21x}}}{\cancel{21x} \cdot \frac{49}{\cancel{21x}}} = \frac{\cancel{21x} \cdot \frac{49}{\cancel{21x}}}{\cancel{21x} \cdot \frac{49}{\cancel{21x}}}$$

$$\frac{12 + 7x}{1} = \frac{49}{1}$$

$$12 + 7x = 49$$

$$-12 = -12$$

$$\frac{7x}{7} = \frac{37}{7}$$

$$x = \frac{37}{7}$$

3. $\frac{\frac{3(x+2)}{3} + \frac{4}{3x}}{\frac{11}{1} \cdot \frac{3x}{3x}}$

CD: $3x$

New Step: Mult. both sides by CD

$$\frac{\cancel{3x} \cdot \frac{3x+6+4}{\cancel{3x}}}{\cancel{3x} \cdot \frac{33x}{\cancel{3x}}} = \frac{\cancel{3x} \cdot \frac{33x}{\cancel{3x}}}{\cancel{3x} \cdot \frac{33x}{\cancel{3x}}}$$

$$\frac{3x+10}{1} = \frac{33x}{1}$$

$$3x+10 = 33x$$

$$10 = 30x$$

$$\frac{10}{30} = \frac{30x}{30}$$

$$\frac{1}{3} = x$$

4. $\frac{\frac{a}{a+3}}{\frac{2a}{a-3} - \frac{a^2-9}{a^2-9}}$

CD: $(a+3)(a-3)$

New Step: Mult. both sides by CD

$$\frac{\cancel{(a+3)(a-3)} \cdot \frac{a}{\cancel{(a+3)(a-3)}}}{\cancel{(a+3)(a-3)} \cdot \frac{2a(a-3) - (a^2-9)}{\cancel{(a+3)(a-3)} \cdot (a-3)(a-3)}} = \frac{\cancel{(a+3)(a-3)} \cdot \frac{2a^2 + 6a - a^2 + 9}{\cancel{(a+3)(a-3)} \cdot (a-3)(a-3)}}{\cancel{(a+3)(a-3)} \cdot \frac{(a-3)(a-3)}{\cancel{(a+3)(a-3)}}}$$

$$\frac{a^2 - 3a}{(a-3)(a-3)} = \frac{2a^2 + 6a - a^2 + 9}{(a-3)(a-3)}$$

$$\frac{-a^2 - 3a}{-a^2 + 3a} = \frac{-a^2 + 6a + 9}{-a^2 + 3a}$$

$$0 = 9a + 9$$

$$-\frac{9}{9} = \frac{9a}{9}$$

$$-1 = a$$

7.5 Solving Rational Equations HW

Name _____

Solve each rational equation. Check your solutions.

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

2. $\frac{1}{x} - \frac{x}{9} = 0$

3. $\frac{4}{x} = \frac{x}{4}$

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

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

6. $\frac{2}{x+3} + \frac{5}{3-x} = \frac{6}{x^2-9}$

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

Warm-up:

Simplify $\frac{x+2}{x} + \frac{4}{3x}$