

2-3 HW Answer Key

1. $(a-b)$

2. $\frac{21}{10(x+3)}$

3. $\frac{(x-6)}{x(x+6)}$

4. $\frac{-4}{(x-4)(x+4)}$

5. $\frac{b^2 - a^2}{ab(x+y)}$

6. $\frac{x^2 + 3x - 12}{(x-3)(x+4)(x+6)}$

7. $\frac{x^2 + 2xw - w^2}{w^2 x^2}$

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

Aug 10-10:14 PM

Alg 2 Homework 2-3

Name Key (2016)Add or subtract. Simplify if possible. Assume all fractions are defined

$$1. \frac{a^2}{a+b} - \frac{b^2}{a+b} = \frac{a^2 - b^2}{a+b}$$

$$= \frac{(a+b)(a-b)}{a+b}$$

$$= \boxed{a-b}$$

$$2. \frac{5}{2x+6} - \frac{2}{5x+15}$$

$$\left(\frac{5}{5}\right) \frac{5}{2(x+3)} - \frac{2}{5(x+3)} \left(\frac{2}{2}\right)$$

$$\frac{25}{10(x+3)} - \frac{4}{10(x+3)} = \boxed{\frac{21}{10(x+3)}}$$

$(\cancel{10} \neq (x+6)(x+3))$

$$3. \frac{x}{x^2+9x+18} - \frac{3}{x^2+3x}$$

$$\left(\frac{x}{x}\right) \frac{x}{(x+6)(x+3)} - \frac{3}{x(x+3)} \left(\frac{x+6}{x+6}\right)$$

$$\frac{x^2}{x(x+6)(x+3)} - \frac{3(x+6)}{x(x+6)(x+3)}$$

$$\frac{x^2 - 3x - 18}{x(x+6)(x+3)} = \frac{(x-6)(x+3)}{x(x+6)(x+3)}$$

$$= \boxed{\frac{x-6}{x(x+6)}}$$

$$4. \frac{x}{x^2-16} - \frac{1}{x-4}$$

$$\frac{x}{(x+4)(x-4)} - \frac{1}{x-4} \left(\frac{x+4}{x+4}\right)$$

$$\frac{x}{(x+4)(x-4)} - \frac{x+4}{(x-4)(x+4)}$$

$$\boxed{\frac{-4}{(x+4)(x-4)}}$$

Aug 11-3:36 PM

$$LCD = a b (x+y)$$

$$5. \frac{a+b}{ax+ay} - \frac{a+b}{bx+by}$$

$$\left(\frac{b}{b}\right) \frac{a+b}{a(x+y)} - \frac{a+b}{b(x+y)} \left(\frac{a}{a}\right)$$

$$\frac{ab+b^2}{ab(x+y)} - \frac{a^2+ab}{ab(x+y)}$$

$$\frac{b^2-a^2}{ab(x+y)} \quad \underline{-a^2+ab}$$

$$6. \frac{x}{x^2+x-12} - \frac{3}{x^2+3x-18}$$

$$\left(\frac{x+6}{x+6}\right) \frac{x}{(x+4)(x-3)} - \frac{3}{(x+6)(x-3)} \left(\frac{x+4}{x+4}\right)$$

$$\frac{x^2+6x}{(x+6)(x+4)(x-3)} - \frac{3x+12}{(x+6)(x-3)(x+4)}$$

$$\frac{x^2+3x-12}{(x+6)(x+4)(x-3)}$$

$$7. \frac{w+x}{w^2x} + \frac{x-w}{wx^2}$$

$$\left(\frac{x}{x}\right) \frac{w+x}{w^2x} + \frac{x-w}{wx^2} \left(\frac{w}{w}\right)$$

$$\frac{xw+x^2}{x^2w^2} + \frac{xw-w^2}{w^2x^2}$$

$$\frac{x^2+2xw-w^2}{x^2w^2}$$

$$8. \frac{1}{x-1} - 2$$

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

$$\frac{1}{x-1} - \frac{2x-2}{x-1}$$

$$\frac{-2x+3}{x-1} \quad \text{or} \quad \frac{3-2x}{x-1}$$

Aug 11-3:37 PM

Rational Expressions

Algebra 2 Unit 2 Day 3

Warm-Up

Add or Subtract: $LCD = (x-4)(x+1)$

$$1. \frac{x}{x^2-3x-4} + \left(\frac{3}{x-4}\right) \frac{x+1}{x+1}$$

$$\frac{x}{(x-4)(x+1)} + \frac{x+3x+3}{(x-4)(x+1)}$$

$$= \frac{x+3x+3}{(x-4)(x+1)} = \frac{4x+3}{(x-4)(x+1)} \quad x \neq 4, -1$$

$$LCD = (x+2)(x+1)$$

$$3. \frac{4x-1}{x^2+3x+2} + \left(\frac{3}{x+1}\right) \frac{x+2}{x+2}$$

$$\frac{4x-1}{(x+2)(x+1)} + \frac{3x+6}{(x+2)(x+1)}$$

$$= \frac{4x-1+3x+6}{(x+2)(x+1)} = \frac{7x+5}{(x+2)(x+1)} \quad x \neq -2, -1$$

$$LCD = (c-5)(5-c)$$

$$2. \frac{3c}{c-5} + \left(\frac{15}{5-c}\right) \frac{-1}{-1} \quad -5+c = c-5$$

$$= \frac{3c-15}{c-5} = \frac{3(c-5)}{c-5} = 3, \quad c \neq 5$$

$$LCD = 3(y+1)(y-2)$$

$$3. \frac{y}{y^2-y-2} + \left(\frac{1}{3y+3}\right) \frac{y-2}{y-2}$$

$$\frac{y}{(y-2)(y+1)} + \frac{y-2}{3(y+1)(y-2)}$$

$$= \frac{3y-(y-2)}{3(y-2)(y+1)} = \frac{3y-y+2}{3(y-2)(y+1)}$$

$$= \frac{2y+2}{3(y-2)(y+1)} = \frac{2(y+1)}{3(y-2)(y+1)}$$

$$= \frac{2}{3(y-2)} \quad y \neq 2, -1$$

Aug 10-10:11 PM

QUIZ

Sep 27-10:30 PM

Rational Equations Algebra 2 Unit 2 Day 4

Solving Rational Equations $\emptyset \quad \cup \quad \sum \quad \}$

Proportions (fraction = fraction)

- State domain restrictions
- Cross multiply (parenthesis around binomials!)
- Solve for x
- Check for extraneous roots (see domain restrictions)

Solve:

1. $\frac{3}{x+2} = \frac{7}{8}$ $x+2 \neq 0$
 $x \neq -2$

$$\begin{array}{r} 3(8) = 7(x+2) \\ 24 = 7x + 14 \\ -14 \quad -14 \\ \hline 10 = 7x \\ \frac{10}{7} = \frac{7x}{7} \\ x = \frac{10}{7} \end{array}$$

No extraneous root here.

2. $\frac{2n}{n+6} = \frac{3}{n-3}$ $n \neq -6, 3$

$$\begin{array}{r} 2n(n-3) = 3(n+6) \\ 2n^2 - 6n = 3n + 18 \\ -18 \quad -3n \quad -3n \quad -18 \\ \hline 2n^2 - 9n - 18 = 0 \\ 2n^2 - 12n + 3n - 18 = 0 \\ 2n(n-6) + 3(n-6) = 0 \\ (n-6)(2n+3) = 0 \\ n = 6 \quad n = -\frac{3}{2} \end{array}$$

$\{6, -\frac{3}{2}\}$

$xy = 36$
 $y = \frac{36}{x}$

$P = -36$
 $S = -9$

$\frac{1}{-12} \frac{36}{3}$

Aug 10-10:15 PM

3. $\frac{2}{x} \cdot \frac{x-1}{3} \quad x \neq 0$

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

$$6 = x^2 - x$$

$$x^2 - x - 6 = 0$$

$$(x-3)(x+2) = 0$$

$$x=3 \quad | \quad x=-2$$

$$\{3, -2\}$$

4. $\frac{16}{x^2-16} \cdot \frac{2}{x-4} \quad x \neq 0$

$$16(x-4) = 2(x^2-16)$$

$$16x - 64 = 2x^2 - 32$$

$$-16x + 64 \quad -16x + 64$$

$$2x^2 - 16x + 32 = 0$$

$$x^2 - 8x + 16 = 0$$

$$(x-4)(x-4) = 0$$

$$x=4 \quad | \quad x=4$$

ϕ or $\{ \}$ reject
Extraneous root!

Aug 10-10:15 PM

Fractional Equations

- State domain restrictions
- Multiply each term by $\frac{LCD}{1}$ to eliminate denominators.
- Solve the resulting equation (usually linear or quadratic)
- Check for extraneous roots (see domain restrictions)

Solve.

5. $\frac{x}{1} \cdot \left(\frac{18}{x} - 3 \right) \cdot \frac{x}{1} \quad x \neq 0$

$$x^2 - 18 = 3x$$

$$x^2 - 3x - 18 = 0 \quad p = -18$$

$$(x-6)(x+3) = 0 \quad s = -3$$

$$x=6 \quad | \quad x=-3$$

$$\{6, -3\}$$

6. $\frac{x^2-4}{1} \cdot \left(\frac{10}{x^2} - \frac{7}{x} \right) \cdot \frac{x^2}{1} \quad x \neq 0$

$$4 - 10x^2 = 3x$$

$$-4 + 10x^2 \quad -4 + 10x^2$$

$$10x^2 + 3x - 4 = 0$$

$$10x^2 - 5x + 8x - 4 = 0$$

$$5x(2x-1) + 4(2x-1) = 0$$

$$(2x-1)(5x+4) = 0$$

$$2x-1=0 \quad | \quad 5x+4=0$$

$$x = \frac{1}{2} \quad | \quad x = -\frac{4}{5}$$

$$\{ \frac{1}{2}, -\frac{4}{5} \}$$

Aug 10-10:15 PM

$$7. \quad \begin{array}{l} x-5 \neq 0 \\ x \neq 5 \end{array} \quad \begin{array}{l} x \neq 5 \\ \text{LCD} = x-5 \end{array}$$

$$\frac{x^5 \left(1 + \frac{5}{x-5}\right) = \frac{(2x-5)x-5}{1}}$$

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

$$x-5 + 5 = 2x-5$$

$$\begin{array}{r} x = 2x - 5 \\ -x \quad -x \\ \hline 0 = x - 5 \end{array}$$

$$0 = x - 5$$

$$\begin{array}{l} 5 = x \\ x = 5 \text{ reject} \\ \text{extraneous root} \end{array}$$

$$\emptyset \text{ or } \{ \}$$

$$8. \quad \frac{x^4 \left(\frac{x}{4} + \frac{5x-20}{4x}\right) = \left(\frac{1}{x}\right)^4 x \quad \begin{array}{l} x \neq 0 \\ \text{LCD} = 4x \end{array}$$

$$x^2 + 5x - 20 = 4$$

$$x^2 + 5x - 24 = 0 \quad \begin{array}{l} 4, 6 \\ 8, -3 \end{array}$$

$$(x+8)(x-3) = 0$$

$$\underline{x = -8 \quad | \quad x = 3}$$

$$\{-8, 3\}$$

Aug 10-10:15 PM