

DAY 1

HW 4-3 Continued

$$1. \frac{8}{3} \neq \frac{7}{k-2} \quad (k \neq 2)$$

$$8(k-2) = 7(3)$$

$$\begin{array}{r} 8k - 16 = 21 \\ +16 \quad +16 \end{array}$$

$$\frac{8k}{8} = \frac{37}{8}$$

$$k = \frac{37}{8} \approx 4.625$$

$$3. \frac{7}{10} = \frac{x+3}{4}$$

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

$$4. \frac{v+6}{3} \neq \frac{v+9}{8} \quad (\text{No excluded values})$$

$$8(v+6) = 3(v+9)$$

$$\begin{array}{r} 8v + 48 = 3v + 27 \\ -3v \quad -3v \end{array}$$

$$\frac{5v + 48}{-48} = \frac{27}{-48}$$

$$\frac{5v}{5} = \frac{-21}{5}$$

$$v = \frac{-21}{5} \approx -4.2$$

$$5. \frac{k+3}{3} \neq \frac{8}{k-2} \quad (k \neq 2)$$

$$(k-2)(k+3) = 3(8)$$

$$k^2 + 3k - 2k - 6 = 24$$

$$\begin{array}{r} k^2 + 1k - 6 = 24 \\ -24 \quad -24 \end{array}$$

$$k = -6, 5$$

$$k^2 + k - 30 = 0$$

$$(k+6)(k-5) = 0$$

$$7. \frac{n+4}{3} = \frac{-3}{n-2}$$

$$6. \frac{1}{n+3} = \frac{n+2}{2}$$

$$8. \frac{3}{x+4} \neq \frac{x+2}{5} \quad (x \neq -4)$$

~~4/3/12~~

$$(3)(5) = (x+4)(x+2)$$

$$\begin{array}{r} 15 = x^2 + 2x + 4x + 8 \\ -15 \quad -15 \end{array}$$

$$0 = x^2 + 6x - 7$$

$$0 = (x+7)(x-1)$$

$$x = -7, 1$$

DAY 2

9. Solve the equation. State the solutions. $\frac{x}{x+5} + \frac{1}{x-2} = \frac{7}{(x+5)(x-2)}$

LCD: $(x+5)(x-2)$ $x \neq -5, 2$

$$\frac{x}{(x+5)} \cdot \frac{(x-2)}{(x-2)} + \frac{1}{(x-2)} \cdot \frac{(x+5)}{(x+5)} = \frac{7}{(x+5)(x-2)}$$

$$\frac{x^2 - 2x + x + 5}{(x+5)(x-2)} = \frac{7}{(x+5)(x-2)}$$

$$\frac{x-2}{x+5} + \frac{1}{x-2} = \frac{7}{(x+5)(x-2)}$$

$$x^2 - x + 5 = 7$$

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

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

$x = \cancel{2}, -1$

10. Solve the equation. State the solutions. $\frac{x}{x-1} + \frac{1}{x-3} = \frac{2}{(x-1)(x-3)}$

11. Solve the equation. State the solutions. $\frac{x+2}{x} - \frac{4}{x-1} + \frac{2}{x(x-1)} = 0$

LCD: $x(x-1)$ $x \neq 0, 1$

$$\frac{(x+2)(x-1)}{x(x-1)} - \frac{4(x)}{x(x-1)} + \frac{2}{x(x-1)} = 0$$

$$\frac{x^2 - x + 2x - 2 - 4x + 2}{x(x-1)} = 0$$

$$x^2 - 3x = 0$$

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

$x = \cancel{0}, 3$

12. It takes 1.5 hours from Tim to mow the lawn. If Kelly mows the same lawn in 2 hours, how long will it take them to mow the lawn together?

Review:

$$\frac{(2x-5)(3x-1)}{10x^2-25x} \cdot \frac{30x^2+75x}{(2x+5)(2x-5)}$$

$$\frac{(x-7)(x+7)}{2x^2} \div \frac{(x+7)}{8x^2}$$

$$\frac{7x+3}{(x+1)(x-1)} - \frac{6x+4}{(x-1)}$$

$$\frac{7x+3}{(x+1)(x-1)} + \frac{6}{x-1}$$

DAY 2

Secondary Math III
HW 4-3 Solving Rational Equations

Name: _____
Period: _____

Solve each rational equation algebraically:

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

$x \neq -4$

$$x = -3(x+4)$$

$$x = -3x - 12$$

$$\begin{array}{r} +3x \\ \hline 4x = -12 \end{array}$$

$$\frac{4x}{4} = \frac{-12}{4} \quad x = -3$$

2. $\frac{x}{2x-10} = 3$

3. $\frac{9}{4x} - \frac{5}{6} = \frac{13}{12x}$

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

LCD: $7(x+1)$

$$\frac{3(7)(x+1)}{(x+1)} + \frac{2(7)(x+1)}{7} = \frac{2(7)(x+1)}{1}$$

$$3(7) + 2(x+1) = 14(x+1)$$

$$21 + 2x + 2 = 14x + 14$$

$$\begin{array}{r} 2x + 23 = 14x + 14 \\ -2x - 14 \quad -2x - 14 \\ \hline 9 = 12x \end{array}$$

$$\frac{9}{12} = \frac{12x}{12}$$

$x = 0.75$

5. $\frac{56}{x^2-2x-15} - \frac{6}{x+3} = \frac{7}{x-5}$

LCD: $(x-5)(x+3)$ $x \neq 5, -3$

$$\frac{56(x-5)(x+3)}{(x-5)(x+3)} - \frac{6(x-5)(x+3)}{(x+3)} = \frac{7(x-5)(x+3)}{(x-5)}$$

$$56 - (6x+30) = 7x+21$$

$$56 - 6x - 30 = 7x + 21$$

$$\begin{array}{r} 26 = 13x + 21 \\ -21 \quad -21 \\ \hline 5 = 13x \end{array}$$

$x = \frac{5}{13} = 0.38$

16. $26 - 6x = 7x + 21$

Art A glassblower can produce several sets of simple glasses in about 3 hours. When the glassblower works with an apprentice, the job takes about 2 hours. How long would it take the apprentice to make the same number of sets of glasses when working alone?

glassblower + apprentice = total

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

$$\frac{2 \cdot 3 \cdot x}{6} + \frac{2 \cdot 3 \cdot x}{x} = \frac{2 \cdot 3 \cdot x}{2}$$

LCD: $2 \cdot 3 \cdot x = 6x$

$$\begin{array}{r} 2x + 6 = 3x \\ -2x \quad -2x \\ \hline 6 = x \end{array}$$

$6 = x$

6 hours