8-5 Day 1.....page

Goal: Solve rational equations.

May 6-10:48 AM

REVIEW!!

Find the least common multiple for each pair.

1. $2x^2$ and $4x^2 - 2x$

$2x(2x-1)$

$2x^2(2x-1)$

2. $x + 5$ and $x^2 - x - 30$

$(x-6)(x+5)$

$(x+5)(x-6)$

Add or subtract. Identify any x-values for which the expression is undefined.

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

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

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

$\frac{5x-2}{4x(x-2)}$

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

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

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

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

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

May 11-2:37 PM

What is the LCM?

Multiply each term by the LCM

5a. Solve the equation $\frac{x}{3}+\frac{5}{2}=4$ $6\cdot\quad 6\cdot$

$2x+15=24$

$-15 \quad -15$

$\frac{2x}{2}=\frac{9}{2}$

$x=\frac{9}{2}$

5b. **Solve the equation** $\frac{10}{3}=\frac{4}{x}+2$ $3x\cdot\quad 3x\cdot\quad x\cdot$

$10x=12+6x$

$-6x \quad -6x$

$\frac{4x}{4}=\frac{12}{4}$

$x=3$

May 11-2:42 PM

What is the LCM?

Multiply each term by the LCM

6. **Solve the equation** $x-\frac{18}{x}=3$ $x\cdot\quad x\cdot$

$x^2-18=3x$

$-3x \quad -3x$

$x^2-3x-18=0$

$(x-6)(x+3)=0$

$x-6=0 \quad x+3=0$

$x=6 \quad x=-3$

7. **Solve the equation** $\frac{6}{x}+\frac{5}{4}=-\frac{7}{4}$ $4x\quad 4x\quad 4x$

$24+5x=-7x$

$x=-2$

May 11-2:44 PM

An **extraneous solution** is a solution of an equation derived from an original equation that is not a solution of the original equation. When you solve a rational equation, it is possible to get extraneous solutions. These values should be eliminated from the solution set. Always check your solutions by substituting them into the original equation.

May 11-2:45 PM

Solve each equation.

What are the extraneous values?

Check your solution.

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

$(x-2)$ $(x-2)$

$5x = 3x+4$

$-3x \quad -3x$

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

$x = 2$

Check

$\frac{5(2)}{2-2} \stackrel{?}{=} \frac{3(2)+4}{2-2}$

$\frac{10}{0} \neq \frac{6+4}{0}$

No

No Solution

$\emptyset$

May 11-2:46 PM

What are the extraneous values?

Check your solution.

9. $\frac{2x-5}{x-8} + \frac{x}{2} = \frac{11}{x-8}$

$2(2x-5) + x(x-8) = 11(2)$

$4x - 10 + x^2 - 8x = 22$

$x^2 - 4x - 10 = 22$

$-22 \quad -22$

$x^2 - 4x - 32 = 0$

$(x-8)(x+4) = 0$

$x = 8 \quad x = -4$

Solution

$\frac{2x-5}{x-8} + \frac{x}{2} = \frac{11}{x-8}$

$\frac{2(-4)-5}{-4-8} + \frac{-4}{2} \stackrel{?}{=} \frac{11}{-4-8}$

$\frac{-8-5}{-12} - 2 \stackrel{?}{=} \frac{11}{-12}$

$\frac{+13}{+12} - 2 \stackrel{?}{=} \frac{11}{-12}$

$\frac{13}{12} - 2 \stackrel{?}{=} -\frac{11}{12}$

$-\frac{11}{12} = -\frac{11}{12}$ ✓

May 11-2:47 PM

What are the extraneous values?

Check your solution.

10. **Solve the equation** $\frac{16}{x^2 - 16} = \frac{2}{x-4}$.

$(x+4)(x-4)$ $(x+4)(x-4)$

$(x+4)(x-4)$

$16 = 2(x+4)$

$16 = 2x + 8$

$-8 \quad -8$

$\frac{8}{2} = \frac{2x}{2}$

$x = 4$

$= \frac{2}{-4-4}$

No

$\emptyset$

May 11-2:48 PM

Assignment: p.605 (2-10, 19-27)

May 11-2:50 PM