9-2: Adding/Subtracting Rational Expressions

Perform the indicated operation. List excluded values first.

$$\frac{3x-5}{x+1} - \frac{x+3}{x+1}$$

$x \neq -1$

$\frac{1}{6} + \frac{1}{6} = \frac{2}{6}$

$$\frac{3x-5-x-3}{x+1}$$

$$\frac{2x-8}{x+1} = \frac{2(x-4)}{x+1}$$

You try

$$\frac{x^2-3x-1}{x-2}-\frac{x^2-2x+3}{x-2}$$

$$\frac{4x+3}{x+5}-\frac{x-6}{x+5}$$

Find the LCD of the two expressions

$$\frac{4x-3}{x^2-5x-14} \text{ and } \frac{x+1}{x^2+4x+4}$$

$(x-7)(x+2)$ $\quad$ $(x+2)(x+2)$

$$(x+2)(x-7)(x+2)$$

Perform the indicated operation. List excluded values first.

$$\frac{3}{8x^2} + \frac{1}{12x} \quad \begin{matrix} \cdot 3 \\ \cdot 2x \end{matrix}$$

$$= \frac{9}{24x^2} + \frac{2x}{24x^2}$$

$$\frac{9+2x}{24x^2}, \; x \neq 0$$

You try

$$\frac{3}{10a} + \frac{4}{15a^2}$$

perform the indicated operation and simplify

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

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

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

$x \neq -2, -3$

~~You try~~

LCD: $(x+2)(2x-3)(x+2)$

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

$2x^2+1x-6$

$(2x^2-3x)+(4x-6)$

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

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

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

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

$$\frac{3x^2+10x+8+(-2x^2+5x+3)}{(x+2)^2(2x-3)}$$

$$\frac{x^2+15x+5}{(x+2)^2(2x-3)}, \quad x \neq -2, \frac{3}{2}$$

5
1, 5

$2x-3=0$

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

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

Perform the indicated operation. List excluded values first.

$$\frac{6}{x^2-9}+\frac{x+1}{x+3}-\frac{x-2}{x-3}$$

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

$$\frac{-3x+9}{(x+3)(x-3)}=\frac{-3(x-3)}{(x+3)(x-3)}$$

$x \neq 3, -3$

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

Write a rational expression with the indicated excluded values.

$x \neq 4, x \neq 0$

$$\frac{-92188}{x(x-4)}$$

(B) A freight train averages 30 miles per hour traveling to its destination with full cars and 40 miles per hour on the return trip with empty cars. Find the total time in terms of d. Use the formula $t = \frac{d}{r}$.

Let d represent the one-way distance.

Your Turn

9. A hiker averages 1.4 miles per hour when walking downhill on a mountain trail and 0.8 miles per hour on the return trip when walking uphill. Find the total time in terms of d. Use the formula $t = \frac{d}{r}$.