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College Algebra Extra Credit Session Nov. 12, 2019

§R.7 Continued: Adding/Subtracting Rational Expressions

(R.7.41) Perform the indicated operation. Simplify if possible

(a) $\frac{x^2+x}{x+5} - \frac{25+x}{x+5}$

$\frac{P}{Q} - \frac{R}{Q} = \frac{P-(R)}{Q}$

$\frac{x^2+x-(25+x)}{x+5}$

factors that match top and bottom cancel to 1.

$\frac{x^2+x-25-x}{x+5}$

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

$\frac{x^2-25}{x+5}$ ←

Opposites that are combined cancel to zero

$-3+3+7$

$=7$

$\frac{(x+5)(x-5)}{x+5}$

$(x-5)$


11/12/19, 11:13 AM, 1h 6m 53s
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$= 7$

$\frac{(x+5)(x-5)}{x+5}$

$x-5$

(b) $\frac{x+11}{x-6} - \frac{4x-7}{x-6}$

Show your work here!

$$\frac{x+11}{x-6} - \frac{4x-7}{x-6}$$

$$\frac{P}{Q} - \frac{R}{Q} = \frac{P-(R)}{Q}$$

$$\frac{x+11-(4x-7)}{x-6}$$

SW

$$\frac{-3x+18}{-3} \quad \frac{}{-3}$$

$$\frac{x+11-4x+7}{x-6}$$

$$-3(x-6)$$

$$\frac{-3x+18}{x-6}$$

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

$$-3$$

R.7.65 Rewrite each fraction so that it is equivalent but has a least common denominator

(a) $\frac{6x}{x^2-4}$ and $\frac{2}{x^2+x-6}$

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

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

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

(b) $\frac{5}{x}$ and $\frac{3}{x^2+x}$ and $\frac{7}{x^3-x^2}$

$\frac{5}{x}$ and $\frac{3}{x(x+1)}$ and $\frac{7}{x^2(x-1)}$

Show your work here

$\frac{5}{x}$ and $\frac{3}{x(x+1)}$ and $\frac{7}{x^2(x-1)}$

$\frac{(x-1)}{(x-1)}\frac{5}{x}\frac{(x)(x+1)}{(x)(x+1)}$ $\quad \frac{3(x)(x-1)}{(x)x(x+1)(x-1)}$ $\quad \frac{7(x+1)}{x^2(x-1)(x+1)}$

LCD $(x)(x)(x+1)(x-1)$

**LCD $= x^2(x+1)(x-1)$**

(b)

$$\frac{5}{x} - \frac{3}{x^2+x} + \frac{7}{x^3-x^2}$$

$$\frac{5}{x} - \frac{3}{x(x+1)} + \frac{7}{x^2(x-1)}$$

$$\frac{5(x)(x+1)(x-1)}{x(x)(x+1)(x-1)} - \frac{3(x)(x-1)}{x(x+1)(x)(x-1)} + \frac{7(x+1)}{x^2(x-1)(x+1)}$$

Factor and stay factored

$$\frac{5x(x^2-1)}{x^2(x+1)(x-1)} - \frac{3x^2-3x}{x^2(x+1)(x-1)} + \frac{7x+7}{x^2(x+1)(x-1)}$$

multiply distribute

$$\frac{5x^3-5x}{x^2(x+1)(x-1)} - \frac{3x^2-3x}{x^2(x+1)(x-1)} + \frac{7x+7}{x^2(x+1)(x-1)}$$

combine like terms

$$\frac{5x^3-5x-(3x^2-3x)+7x+7}{x^2(x+1)(x-1)}$$

most imp. part!

$$\frac{5x^3-5x-3x^2+3x+7x+7}{x^2(x+1)(x-1)}$$

$\frac{5x^3 - 3x^2 + 5x + 7}{x^2(x+1)(x-1)}$ ← terms ___ + ___ − ___

← factors (  )(  )(  )

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

Show your work here

$$\frac{6x}{x^2-4} - \frac{2}{x^2+x-6}$$

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

$$\frac{6x^2+18x}{(x+2)(x-2)(x+3)} - \frac{2x+4}{(x+2)(x-2)(x+3)}$$

$$\frac{P}{Q} - \frac{R}{Q} = \frac{P-(R)}{Q}$$

$$\frac{6x^2+18x-(2x+4)}{(x+2)(x-2)(x+3)}$$

$$\frac{6x^2+18x-2x-4}{(x+2)(x-2)(x+3)}$$

$$\boxed{\frac{6x^2+16x-4}{(x+2)(x-2)(x+3)}}$$

$$\frac{2(3x^2+8x-2)}{(x+2)(x-2)(x+3)}$$ ← Good idea, but not helpful.