Name: Key

PAP Algebra II Explore: 9.1 Adding and Subtracting Rational Expressions

Simplify the following expressions, list any excluded values.

A. $\frac{2}{x}+\frac{3}{x}=\frac{5}{x}$

B. $\frac{4}{x+2}+\frac{5}{x+2}=\frac{9}{x+2}$

C. Given: $\frac{2}{x+3}+\frac{7}{x-1}=$?

What is the first step in problem C? Common denom.

For problem C, the common denominator is $(x+3)(x-1)$.

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

What fraction could be multiplied that equals one and creates a common denominator?

$\frac{7}{x-1}\cdot\frac{x+3}{x+3}=\frac{7(x+3)}{(x+3)(x-1)} \Rightarrow \frac{7x+21}{(x+3)(x-1)}$

Now that you have a common denominator, what is the resulting answer? (Make sure to list excluded values)

$\frac{7x+21+2x-2}{(x+3)(x-1)} = \frac{9x+19}{(x+3)(x-1)}$ $x\neq -3$, $x\neq 1$

D $\frac{(3a)\ 3a}{(3a)2b^2c^3}+\frac{b\ (b^2c)}{6ac^2(b^2c)}$

CD: $6ab^2c^3$

$\frac{9a^2}{6ab^2c^3}+\frac{b^3c}{6ab^2c^3} \Rightarrow \frac{9a^2+b^3c}{6ab^2c^3}$

Calculate each sum or difference. Make sure to list the restrictions for the variable, and simplify when possible.

a. $\frac{5x-6}{x^2-9} - \frac{4}{x-3}$ $(x+3)$ $(x+3)$

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

$\frac{5x-6-4x-12}{x^2-9} = \boxed{\frac{x-18}{x^2-9}}$ $\boxed{x \neq -3, 3}$

b. $(x-5)$ $\frac{x-7}{x^2-3x+2} + \frac{4}{x^2-7x+10}$ $(x-1)$

$x-5\ (x-2)(x-1)$ $(x-5)(x-2)(x-1)$

$\frac{x^2-12x+35+4x-4}{(x-2)(x-1)(x-5)}$

$\boxed{\frac{x^2-8x+31}{(x-2)(x-1)(x-5)}}$ $\boxed{x \neq 2, 1, 5}$

c. $(5)\ \frac{2x-5}{(5)\ x} - \frac{4}{5x} - 4\left(\frac{5x}{5x}\right)$

$\frac{10x-25-4-20x}{5x} \Rightarrow \boxed{\frac{-10x-29}{5x}}$ $\boxed{x \neq 0}$

d. $(3)\ \frac{3x-5}{4x^2+12x+9} + \frac{4}{2x+3}$ $3(2x+3)(2x+3)$ $\frac{2x}{3}$ $\frac{(4x^2+12x+9)}{(2x+3)(2x+3)}$

$\frac{9x-15+24x+36-8x^2-24x^2-18x}{3(4x^2+12x+9)}$

	$2x$	$+3$
$2x$	$4x^2$	$6x$
$+3$	$6x$	9

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$\boxed{\frac{-8x^2+21}{3(4x^2+12x+9)}}$ $\boxed{x \neq -3/2}$

9.1 Adding and Subtracting HW

Name: key

Simplify the following expressions and list any excluded values.

1. $\frac{5}{2a+3}+\frac{3a}{2a+3}$ $= \frac{3a+5}{2a+3}$

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

$7x+35+3x-15$

$\frac{10x+20}{(x+5)(x-5)}$

3. $\frac{m}{4m+8}-\frac{1}{m^2+2m}$ $4m$

$4(m+2)$ $m(m+2)(4)$

$\frac{m^2-4}{4m(m+2)}$

$\frac{(m+2)(m-2)}{4m(m+2)} = \frac{m-2}{4m}$

4. $\frac{5}{x^2-36}-\frac{9}{x^2+5x-6}$ $(x-1)(x+6)(x-6)$

$5x-5 \quad -(9x-54)$

$(x-1)(x+6)(x-6) \quad (x+6)(x-1)(x-6)$

$\frac{-4x+49}{(x+6)(x-6)(x-1)}$

5. $\frac{n}{n^2-n-20}+\frac{2}{n+4}$ $(n-5)$

$2n-10$

$(n-5)(n+4)$

$\frac{3n-10}{(n-5)(n+4)}$

$m^2-3m-6m+18$ (−9m) $\quad m^2+3m-6m-18$ (−3m)

6. $\dfrac{m-3}{m^2+5m+6}+\dfrac{m-6}{m^2-4m-12}$ $(m+3)$

$(m+6)(m+3)(m+2) \quad (m-6)(m+2)(m+3)$

$$\frac{2m^2-12m}{(m-6)(m+3)(m+2)}=\frac{2m(m-6)}{(m-6)(m+3)(m+2)}$$

$$\boxed{\frac{2m}{(m+3)(m+2)}}$$

7. $\dfrac{2c}{3a^2b}+\dfrac{a}{4bc^2}$ $(4c^2)$ $(3a^2)$ $\quad 12a^2bc^2$

$$\boxed{\frac{8c^3+3a^3}{12a^2bc^2}}$$

8. $\dfrac{m}{m^2+3m}-\dfrac{3m}{m^2-9}$ $(m-3)$ m

$m(m+3) \quad (m+3)(m-3)m$

$$\frac{m^2-3m-[3m^2]}{m(m+3)(m-3)}$$

$$\frac{-2m^2-3m}{m(m+3)(m-3)} \rightarrow \boxed{\frac{-2m-3}{(m+3)(m-3)}}$$

9. $\dfrac{x}{x^2+5x+6}-\dfrac{2}{x^2+3x+2}$ $(x+1)$ $(x+3)$

$x^2+x \quad -[2x+6]$

$(x+1)(x+3)(x+2) \quad (x+2)(x+1)(x+3)$

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

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

10. $\dfrac{4x}{x^2-16}-\dfrac{x+2}{x-4}$ $(x+4)$ $(x+4)$

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

$$\frac{4x-[x^2+4x+2x+8]}{(x+4)(x-4)} \qquad 6x$$

$$\frac{-x^2-2x-8}{(x+4)(x-4)} \rightarrow \boxed{\frac{-(x^2+2x+8)}{(x+4)(x-4)}} \qquad (x+4)(x+4)$$