

1.9 Adding and Subtracting Rational Expression-Part1

Recall: $\frac{2}{3} - \frac{1}{6}$

$$= \frac{4}{6} - \frac{1}{6}$$

$$= \frac{3}{6}$$

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

$\frac{7}{9} - \frac{5}{6} = \frac{7 \times 2}{9 \times 2} - \frac{5 \times 3}{6 \times 3}$

$$= \frac{14}{18} - \frac{15}{18}$$

$$= \frac{14-15}{18}$$

$$= -\frac{1}{18}$$

STEPS
1. Find a common denominator and rewrite
2. Add or subtract the numerators
3. State the restrictions

Ex. 1 Simplify

a) $\frac{3}{y^2} - \frac{2}{y^2} + \frac{6}{y^2} = \frac{3-2+6}{y^2}$

$$= \frac{7}{y^2} \quad \text{Rest. } y \neq 0$$

b) $\frac{2x+5}{x^2-9} + \frac{6x}{x^2-9}$

$$= \frac{2x+5+6x}{x^2-9}$$

$$= \frac{8x+5}{x^2-9} \quad \text{Rest. } x \neq \pm 3$$

c) $\frac{5x-1}{6} - \frac{7x+2}{4}$

$$= \frac{2(5x-1) - 3(7x+2)}{12}$$

$$= \frac{10x-2-21x-6}{12}$$

$$= \frac{-11x-8}{12}$$

$$\begin{aligned}
 \text{d) } & \frac{5}{x^2-4} - \frac{3}{4-x^2} \\
 & = \frac{5}{x^2-4} - \frac{3}{-(x^2-4)} \\
 & = \frac{5+3}{x^2-4} \\
 & = \frac{8}{x^2-4}
 \end{aligned}$$

Factor out a
-1 from the
denominator

Rest.
 $x \neq \pm 2$



$$\text{e) } \frac{5x^2-4x+2}{x-1} + \frac{3x^2+6x-1}{1-x}$$

$$= \frac{5x^2-4x+2}{x-1} - \frac{3x^2+6x-1}{x-1}$$

$$= \frac{5x^2-4x+2 - (3x^2+6x-1)}{x-1}$$

$$= \frac{5x^2-4x+2-3x^2-6x+1}{x-1}$$

$$= \frac{2x^2-10x+3}{x-1}$$

← Check to see if you
can factor & further
simplify

Rest
 $x \neq 1$

$$\text{f) } \frac{3a-b}{9} - \frac{a-2b}{3} - \frac{4a-3b}{6}$$

$$= \frac{2(3a-b) - 6(a-2b) - 3(4a-3b)}{18}$$

$$= \frac{6a-2b-6a+12b-12a+9b}{18}$$

$$= \frac{-12a+19b}{18}$$

$$g) \frac{2x^3}{3y^2} \times \frac{9y}{10x} - \frac{2y}{3x}$$

WATCH YOUR ORDER OF OP.
BEDMAS

$$= \frac{3x^2}{5y} - \frac{2y}{3x} \quad \left\{ \begin{array}{l} \text{Common denom?} \\ (5y)(3x) \end{array} \right.$$

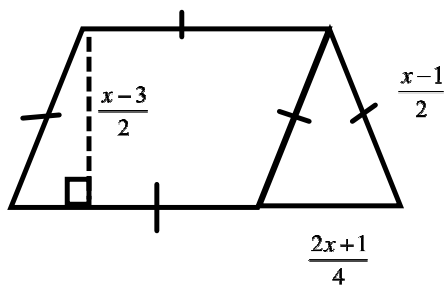
$$= \frac{3x(3x^2) - 5y(2y)}{15xy}$$

$$= \frac{9x^3 - 10y^2}{15xy} \quad \begin{array}{l} \text{Rest.} \\ x \neq 0 \\ y \neq 0 \end{array}$$

Ex. 2

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Note: this is a 2D figure
Rhombus and triangle NOT a
triangular prism



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1b,2eg,3,4d,5e,6acdf,8,11

