

5.6: Adding Rational Expressions

- Step 1: make sure we have a common denominator
- 2: Factor denominator
- 3: Replace
- 4: Add numerators $\frac{3}{3}$ keep common denominator
- 5: Simplify (factor $\frac{3}{3}$ cancel)

Ex 1) $\frac{6x}{x^2+4x-5} + \frac{30}{x^2+4x-5}$

$(x-1)(x+5)$ \rightarrow

$$\frac{6x}{(x-1)(x+5)} + \frac{30}{(x-1)(x+5)}$$

$$\frac{6x+30}{(x-1)(x+5)}$$

$\frac{6x+30}{6} \quad \frac{30}{6}$
 $6(x+5)$

$$\frac{6(x+5)}{(x-1)(x+5)}$$

6
x-1

$$\text{Ex 2)} \quad \frac{2x+3}{2x^2-7x-4} + \frac{x+2}{2x^2-7x-4}$$

$$(2x^2 - 7x - 4)$$

$$-8x^2$$

$$-8x + x = -7x$$

$$\frac{2x^2 - 8x}{2x} \mid \frac{x - 4}{1} \quad \frac{1}{1}$$

$$2x(x-4) \mid +1(x-4)$$

$$(x-4)(2x+1)$$

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

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

$$\boxed{\frac{3x+5}{(x-4)(2x+1)}}$$

Ex 3) $\frac{-3x^2+7}{x^2-5x-24} + \frac{4x^2-16}{x^2-5x-24}$

$x^2-5x-24 = (x+3)(x-8)$

$\frac{-3x^2+7}{(x+3)(x-8)} + \frac{4x^2-16}{(x+3)(x-8)}$

$\frac{-3x^2+7+4x^2-16}{(x+3)(x-8)}$

$\frac{x^2-9}{(x+3)(x-8)}$

$\frac{x^2-9}{(x+3)(x-3)}$

$\sqrt{x^2} = x$ $\sqrt{9} = 3$

$\frac{\cancel{(x+3)}(x-3)}{\cancel{(x+3)}(x-8)}$

$x-3$
$x-8$