

## Warm-Up:

Simplify each rational expression. State any restriction

1)  $\frac{x^2 - 36}{x + 6}$

2)  $\frac{x^2 + 7x + 12}{x^2 + 8x + 16}$

3) Use long division to divide  $x^3 - 7x - 6$  by  $x - 4$

4) Factor  $x^2 + x + 2x + 2x$

5) Factor  $2x^2 + 11x + 18$

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## Player Coach

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

2.  $x^3 + 64$   
 $(x + 4)(x^2 - 4x + 16)$

4.  $\frac{7x^3 + 14x^2 + 7x}{7x(x^2 + 2x + 1)}$   
 $\frac{1}{2} \quad \frac{1}{1}$   
 $7x(x + 1)(x + 1)$

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

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

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

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## Unit 1 ~ Polynomials

Objective: A.APR.7

# Day 9: Adding & Subtracting Rationals

Example 1:  $\frac{2}{3} + \frac{1}{2}$

$$\frac{2 \times 2}{2 \times 3} + \frac{1 \times 3}{2 \times 3}$$

$$\frac{4}{6} + \frac{3}{6} = \frac{7}{6}$$

$$\frac{2}{2} \cdot \frac{1}{4} + \frac{1}{8}$$

$$\frac{2}{8} + \frac{1}{8} = \frac{3}{8}$$

Common denom  
is 6:

Example 2:  $\frac{2y+1}{5y} + \frac{5y+4}{5y}$

$$\frac{\boxed{2y+1} + \boxed{5y+4}}{5y}$$

$$= \frac{7y+5}{5y}$$

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

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

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

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

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

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

Steps

1. factor my denom
2. find the LCM
3. multiply
4. combine like terms

Example 4:  $\frac{x+1}{x-1} - \frac{2}{x^2-x}$

$$\frac{x \cdot \overbrace{x+1}^{\text{arc}}}{x \cdot x-1} - \frac{2}{x(x-1)}$$

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

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

1. factor denom.
2. find the LCM (x)
3. multiply
4. combine like terms.

Example 5:  $\frac{x}{x^2-4} + \frac{1}{x+2}$

$$\frac{x}{(x-a)(x+a)} + \frac{1}{x+a} \cdot \frac{(x-a)}{(x-a)}$$

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

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

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

1. factor denom

2. find the LCM  
(x-a)

3. multiply

4. combine like terms.

Example 6:  $\frac{x-1}{x+5} - \frac{5x+5}{x^2+6x+5}$

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

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

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

