# Adding and Subtraction RATIONAL Expressions (fractions)

- 1. Common Denominator
- 2. If subtraction, distribute the negative to all terms in the numerator that follows the "-".
- 3. Add NUMERATOR
- 4. DENOMINATOR stays the same!!!!!
- 5. Simplify, if possible.
- 6. Name restrictions.

$$1. \frac{1}{4} \div \frac{5}{4} = \frac{6}{4}$$

$$= \frac{3}{2}$$

$$3. \frac{4x+11}{x+3} + \frac{x+4}{x+3}$$

$$= \frac{5x+15}{(x+3)} - \frac{x+3}{5}$$

$$= \frac{5(x+3)}{(x+3)} - \frac{5}{5}$$

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

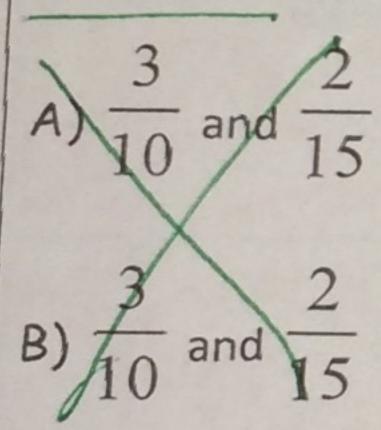
$$=\frac{6}{2x^2}$$

$$=\sqrt{34}$$

$$4. \frac{4x-1}{x^2-4} = 3x-3$$

## Least Common Multiples of Polynomials LCM

#### LEM



Find the LCM of each pair.  $\frac{11}{2x^3y^7z}$  and  $30x^5y^4z^7$ 

5.  $2x^3y^4$  and  $3x^5y^3$ 

Biggest 60 x 5 y 2

#### LEM of Polynomials

- 1. Factor each polynomial completely. Write any repeated factors as powers. For example,  $x^3 + 6x^2 + 9x = x(x+3)^2$
- 2. List the different factors. If the polynomials have common factors, use the highest power of each common factor.

7.  $x^2 + 3x - 4$  and  $x^2 - 3x + 2$ 

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

LCM

(X+4) (X-1) (X-2)

8.  $x^3 - 4x$  and  $x^2 + 4x + 4$ 

X(X=4) (X+2)(X+2) X(X+2)(X-2) (X+2)<sup>2</sup>

CM X(X+2)(X-2)(X+2)

#### ADDING WITH UNLIKE DEMOMINATORS

- 1. Factor the denominators\_ ONLY!
- 2. Write the COMMON
  DENOMINATOR, using
  EACH FACTOR from the
  first fraction and all
  FACTORS from the other
  fractions THAT ARE NOT
  ALREADY WRITTEN
  DOWN.
- 3. Write equivalent fractions by multiplying the first fraction by a VALUE OF 1 in the form of what is needed to make the 1st denominator the same as the common denominator. Repeat for other fractions.
- 4. Add, and simplify.

$$(x+3) = x + \frac{2x+6}{x^2+6x+9}$$

$$= (x+3)(x+3) + \frac{2x+46}{(x+3)(x+3)}$$

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$$= (x+3)(x+3)$$

### SUBTRACTING WITH UNLIKE DE

- 1. Distribute the negative to the NUMARATOR ONLY
- 2. Factor the denominators ONLY!
- 3. Find Common
  Denominators and
  write equivalent
  fractions.
- 4. Add, and simplify.

13. 
$$\frac{2x^{2}-16(-x+4)(x-2)}{x^{2}-4} \times +2(x-2)$$

$$2x^{2}-4(x+2)(x-2)$$

$$2x^{2}-16(-x+4)(x-2)$$

$$2x^{2}-4(x+2)(x-2)$$

$$2x^{2}-16(-x+4)(x-2)$$

$$2x^{2}-4(x+2)(x-2)$$

$$(x+2)(x-2)$$

$$(x+2)(x-2)$$

$$(x+2)(x-2)$$

$$(x+2)(x-2)$$

$$(x+2)(x-2)$$

$$(x+2)(x-2)$$

15. 
$$\frac{2x^2 + 64}{x^2 - 64} = \frac{x - 4}{x + 8}$$

Dmi

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