

Lesson 4 Addition and Subtraction of Rational Expressions
(Monomial Denominators)

Part I – Common Denominators

Steps for Adding or Subtracting (Common Denominators):

- Add or Subtract the numerators, keeping the denominators the same
- State restrictions (set denominator equal to 0)

Examples

Add or Subtract

1.) $\frac{5}{a} + \frac{3}{a}$

$$\frac{8}{a}$$

$$a \neq 0$$

2.) $\frac{3}{m-2} + \frac{2}{2-m}$

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

$$\frac{3-2}{m-2}$$

$$\frac{1}{m-2}$$

$$m \neq 2$$

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

Part II – Different Denominators

Steps for Adding or Subtracting (Different Denominators):

- Factor all expressions
- Write each term with the lowest common denominator (LCD)
- Add or Subtract the numerators, keeping the denominators the same
- State restrictions (set denominator equal to 0)
- **Note:** the LCD is the product which contains each factor that occurs the greatest number of times in any denominator.

Examples

$$\frac{(\cancel{x^2})^2}{\cancel{x^2}xy} + \frac{3yz}{x^2yz} + \frac{4x^2}{yzx^2}$$

$$\frac{2x^2 + 3yz + 4x^2}{x^2yz}$$

$$x, y, z \neq 0$$

LCD
 x^2yz

$$\frac{6(3)}{10x} + \frac{6(2)}{5x(2)} - \frac{4(5)}{2x(5)}$$

$$\frac{3(10) + 6(2) - 4(5)}{10x}$$

$$\frac{22}{10x}$$

$$\frac{11}{5x}$$

$$x \neq 0$$

← always reduce

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Pre-Calculus 11 Enriched Rational Expressions & Equations

$$3. \frac{2a+1}{2a^2b} - \frac{b-3}{9ab^2}$$

LCD
 $18a^2b^2$

$$\frac{9b(2a+1) - 2a(b-3)}{18a^2b^2}$$

$$\frac{18ab + 9b - 2ab + 6a}{18a^2b^2}$$

$$\frac{16ab + 6a + 9b}{18a^2b^2}$$

$a, b \neq 0$

$$4. \frac{2w+3}{4w^2} - \frac{w-1}{3w} + \frac{w+2}{6}$$

LCD
 $12w^2$

$$\frac{3(2w+3) - 4w(w-1) + 2w^2(w+2)}{12w^2}$$

$$\frac{6w+9 - 4w^2+4w + 2w^3 + 4w^2}{12w^2}$$

$$\frac{2w^3 + 10w + 9}{12w^2}$$

$w \neq 0$

riddle sheet
Lives in Sea and Yells