

## Today's Learning Goal(s):

Date: Feb. 12/20  
(Every lesson)

By the end of the class, I will be able to:

- a) add or subtract rational expressions and state any restrictions.

## 2.7 Adding and Subtracting Rational Expressions Day 1

Ex.1 Simplify. State any restrictions on the variables.

a)  $\frac{5}{6} + \frac{3}{4}$  LCD =  $3 \cdot 2 \cdot 2$   
= 12

$$= \frac{5}{3 \cdot 2} + \frac{3}{2 \cdot 2}$$

$$= \frac{5 \cdot 2}{3 \cdot 2 \cdot 2} + \frac{3 \cdot 3}{3 \cdot 2 \cdot 2}$$

$$= \frac{10}{12} + \frac{9}{12}$$

$$= \frac{19}{12}$$

c)  $\frac{1}{6x^2} - \frac{3}{8y} + \frac{5}{4xy}$  LCD =  $24x^2y$

$$= \frac{1(4y)}{24x^2y} - \frac{3(3x^2)}{24x^2y} + \frac{5(6x)}{24x^2y}$$

$$= \frac{4y - 9x^2 + 30x}{24x^2y}$$

R:  $x \neq 0, y \neq 0$

b)  $\frac{1}{3x} + \frac{3}{4y}$  LCD  $12xy$

$$= \frac{1(4y)}{12xy} + \frac{3(3x)}{12xy}$$

$$= \frac{4y + 9x}{12xy} \quad R: x \neq 0, y \neq 0$$

d)  $\frac{5}{x-2} - \frac{3}{x+3}$  LCD =  $(x-2)(x+3)$  Don't forget restrictions!

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

$$= \frac{5x+15 - 3x+6}{(x-2)(x+3)}$$

$$= \frac{2x+21}{(x-2)(x+3)}$$

R:  $x \neq 2, 3$

Simplify. State any restrictions on the variables.

$$e) \frac{5}{4a-2} - \frac{7}{6a-3}$$

$$= \frac{5}{2(2a-1)} - \frac{7}{3(2a-1)} \quad \text{LCD} = 6(2a-1)$$

$$= \frac{5(3)}{6(2a-1)} - \frac{7(2)}{6(2a-1)}$$

$$= \frac{15-14}{6(2a-1)}$$

$$= \frac{1}{6(2a-1)}$$

$$R: 2a-1 \neq 0 \\ 2a \neq 1 \\ a \neq \frac{1}{2}$$

$$\left. \begin{aligned} & \frac{5(6a-3) - 7(4a-2)}{(4a-2)(6a-3)} \\ &= \frac{30a-15-28a+14}{(4a-2)(6a-3)} \\ &= \frac{2a-1}{(4a-2)(6a-3)} \\ &= \frac{\cancel{2a-1}}{2\cancel{(2a-1)}(6a-3)} \end{aligned} \right\}$$

$$\left. \begin{aligned} 4a-2 \neq 0 \\ 4a \neq 2 \\ a \neq \frac{2}{4} \\ a \neq \frac{1}{2} \end{aligned} \right\} \begin{aligned} 6a-3 \neq 0 \\ 6a \neq 3 \\ a \neq \frac{3}{6} \\ a \neq \frac{1}{2} \end{aligned}$$

$$\begin{aligned} &= \frac{1}{2(6a-3)} \\ &= \frac{1}{2(3(2a-1))} \\ &= \frac{1}{6(2a-1)} \end{aligned}$$

Are there any Homework Questions you would like to see on the board?

Last day's work: pp. 122-123 #(4-7)ac, 8, 9, 11 [13]

Today's Homework Practice includes:

**READ pp.124-127**

p. 128 #1 - 5

9, 5c

p. 122 4. Simplify. State any restrictions on the variables.

a)  $\frac{2x^2}{7} \times \frac{21}{x}$

c)  $\frac{2x^3y}{3xy^2} \times \frac{3}{4x^2y}$

R:  $x \neq 0, y \neq 0$

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

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

$$= \frac{3x}{2y^2}$$

p. 122

5. Simplify. State any restrictions on the variables. c)  $\frac{2(x-2)}{9x^3} \times \frac{12x^4}{2-x}$

a)  $\frac{\cancel{2}(x+1)}{3} \times \frac{x-1}{\cancel{6}(x+1)}$   
 $= \frac{x-1}{9}$

R:  $x \neq -1$

d)  $\frac{3(m+4)^2}{2m+1} \div \frac{5(m+4)}{7(m+2)}$

$= \frac{3(m+4)^{\cancel{2}}}{2m+1} \times \frac{7(m+2)}{\cancel{5}(m+4)}$   
 $= \frac{21(m+4)(m+2)}{5(2m+1)}$

R:  $m \neq -\frac{1}{2}, -2, -4$   
 $2m+1 \neq 0$   
 $2m \neq -1$   
 $m \neq -\frac{1}{2}$

c)  $\frac{2(x-2)}{\cancel{9x^3}} \times \frac{\cancel{12x^4}}{\cancel{2-x}}$   
 $= \frac{8x}{-3}$   
 $= -\frac{8x}{3}$

R:  $x \neq 0, 2$

$\left\{ \begin{array}{l} x^3 \neq 0 \\ x \neq 0 \\ \hline 2-x \neq 0 \\ 2 \neq x \end{array} \right.$

p. 122 6. Simplify. State any restrictions on the variables.

$$c) \frac{2x^2 - x - 1}{x^2 - x - 6} \times \frac{6x^2 - 5x + 1}{8x^2 + 14x + 5}$$

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

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

$$R: x \neq 3, -2, -\frac{5}{4}, -\frac{1}{2}$$

$$d) \frac{9y^2 - 4}{4y - 12} \div \frac{9y^2 + 12y + 4}{18 - 6y}$$

$$= \frac{(3y-2)(3y+2)}{4(y-3)} \div \frac{(3y+2)(3y+2)}{6(3-y)}$$

$$= \frac{(3y-2)\cancel{(3y+2)}}{4(y-3)} \times \frac{6(-1)\cancel{(y-3)}}{(3y+2)\cancel{(3y+2)}}$$

$$= \frac{-3(3y-2)}{4(3y+2)}$$

$$= \frac{-3(3y-2)}{2(3y+2)} \quad R: y \neq 3, -\frac{2}{3}$$

7. Simplify. State any restrictions on the variables.

$$a) \frac{x^2 - 5xy + 4y^2}{x^2 + 3xy - 28y^2} \times \frac{x^2 + 2xy + y^2}{x^2 - y^2}$$

$$= \frac{\cancel{(x-y)}\cancel{(x-4y)}}{(x+7y)\cancel{(x-4y)}} \times \frac{(x+y)\cancel{(x+y)}}{\cancel{(x-y)}\cancel{(x+y)}}$$

$$= \frac{(x+y)}{(x+7y)} \quad R: x \neq -7y, 4y, y, -y$$

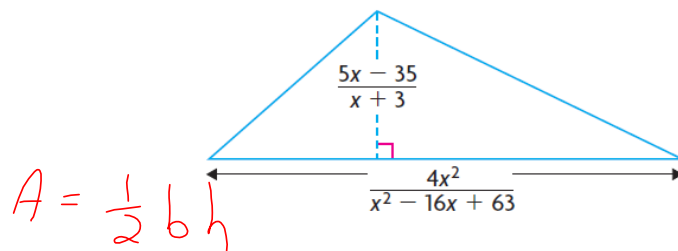
$$c) \frac{10x^2 + 3xy - y^2}{9x^2 - y^2} \div \frac{6x^2 + 3xy}{12x + 4y}$$

$$= \frac{(5x-y)(3x+y)}{(3x-y)(3x+y)} \div \frac{3x(2x+y)}{4(3x+y)}$$

$$= \frac{(5x-y)\cancel{(3x+y)}}{\cancel{(3x-y)}\cancel{(3x+y)}} \times \frac{4\cancel{(3x+y)}}{3x\cancel{(2x+y)}}$$

$$= \frac{4(5x-y)}{3x(3x-y)} \quad R: y \neq \pm 3x, -2x, x \neq 0$$

p. 122 9. Determine the area of the triangle in simplified form. State the restrictions.



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

$$= \frac{1}{2} \left( \frac{4x^2}{x^2 - 16x + 63} \right) \left( \frac{5x - 35}{x + 3} \right)$$

$$= \frac{1}{2} \left( \frac{24x^2}{(x-9)(x-7)} \right) \left( \frac{5(x-7)}{(x+3)} \right)$$

$$= \frac{10x^2}{(x-9)(x+3)}$$

$$R: x \neq 9, 7, -3$$

$$A = \frac{1}{2}bh \text{ or } A = \frac{bh}{2}$$

13. Simplify. State any restrictions on the variables.

$$\frac{m^2 - mn}{6m^2 + 11mn + 3n^2} \div \frac{m^2 - n^2}{2m^2 - mn - 6n^2}$$

$$\frac{4m^2 - 7mn - 2n^2}{3m^2 + 7mn + 2n^2}$$

$$= \left[ \frac{m(m-n)}{(3m+n)(2m+3n)} \div \frac{(m-n)(m+n)}{(2m+3n)(m-2n)} \right] = \left[ \frac{(4m+n)(m-2n)}{(3m+n)(m+2n)} \right]$$

$$= \frac{m(m-n)}{(3m+n)(2m+3n)} \times \frac{(2m+3n)(m-2n)}{(m-n)(m+n)} \times \frac{(3m+n)(m+2n)}{(4m+n)(m-2n)}$$

$$= \frac{m(m+2n)}{(m+n)(4m+n)}$$

$$R: m \neq -\frac{1}{3}n, -\frac{3}{2}n, 2n, -2n, -\frac{1}{4}n, \frac{1}{3}n$$