

$$48/48 = 100$$

Foundations for College Algebra - MW  
University of North Georgia  
Fall 2015  
Exam #3

Name: Key Date: November 30, 2015

Simplify the Rational Expression completely.

$$1. \frac{2x^2y^2}{x^4y} = \boxed{\frac{2y}{x^2}}$$

$$2. \frac{s^2}{t^2} \div \frac{6s^4}{t^4} = \boxed{\frac{t^2}{6s^2}}$$

$$3. \frac{8x}{15yz} - \frac{16x}{15yz} = \frac{-8x - 16x}{15yz} = \frac{-24x}{15yz} = \frac{3(-8x)}{3(5yz)} = \boxed{-\frac{8x}{5yz}}$$

$$4. \frac{11}{18rs^2} + \frac{5}{24r^2s}$$

$3(6rs^2) \quad 3(8r^2s) \rightarrow \text{LCD: } 72r^2s^2$

$$\frac{11(4r) + 5(3s)}{72r^2s^2} = \frac{44r + 15s}{72r^2s^2}$$

Solve the following equations for the specified variable.

5.  $1 - \frac{2}{x} = \frac{3}{x^2}$  LCD:  $x^2$

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

$$x^2 - 2x = 3$$

$$x^2 - 2x - 3 = 0$$

$$(x-3)(x+1) = 0$$

$$\textcircled{1} x = 3$$

$$\textcircled{2} x = -1$$

6.  $x = 7 + \frac{44}{x}$  LCD:  $x$

$$x(x) = x(7) + x\left(\frac{44}{x}\right)$$

$$x^2 = 7x + 44$$

$$x^2 - 7x - 44 = 0$$

$$(x-11)(x+4) = 0$$

$$\textcircled{1} x = 11$$

$$\textcircled{2} x = -4$$

7.  $\frac{1}{3x^2} = \frac{x+3}{2x^2} - \frac{1}{6x^2}$  LCD:  $6x^2$

$$\cancel{6x^2}^2 \left(\frac{1}{\cancel{3x^2}}\right) = \cancel{6x^2}^3 \left(\frac{x+3}{\cancel{2x^2}}\right) + \cancel{6x^2} \left(-\frac{1}{\cancel{6x^2}}\right)$$

$$2 = 3x + 9 - 1$$

$$2 = 3x + 8$$

$$-6 = 3x$$

$$\boxed{-2 = x}$$

Factor completely.

8.  $2x - 8x^3$

$$2x(1 - 4x^2) \quad a=1, b=2x$$

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

9.  $6x^2 - 11x - 10$

$$a = -60 \quad b = -11$$

$$\frac{-11 \pm 4}{15 \mid 4}$$

$$6x^2 - 15x + 4x - 10$$

$$3x(2x-5) + 2(2x-5)$$

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

Simplify

$$10. \frac{40 - (3 \cdot 7 - 9)}{8 \cdot 2 - 2} = \frac{40 - (21 - 9)}{16 - 2} = \frac{40 - (12)}{14} = \frac{28}{14} = \boxed{2}$$

Solve.

$$11. 3(x - 4) = 2(x + 3) + 2$$

$$3x - 12 = 2x + 6 + 2$$

$$3x - 12 = 2x + 8$$

$$\boxed{x = 20}$$

12. State the **Distributive Tool** Algebraically and give an example of how it is used to factor an expression.

$$a(b + c) = ab + ac$$

$$\text{e.g.: } 14x + 8 = 2(7x + 4)$$

BONUS. Solve for 5 Points.

$$\frac{x-4}{6x} + \frac{x^2-3x-10}{6x} = \frac{x-1}{6} \quad \text{LCD: } 6x$$

$$6x \left( \frac{x-4}{6x} \right) + 6x \left( \frac{x^2-3x-10}{6x} \right) = 6x \left( \frac{x-1}{6} \right)$$

$$x-4 + x^2-3x-10 = x^2-x$$

$$-2x - 14 = -x$$

$$-x = 14$$

$$\boxed{x = -14}$$