Name: _____ Period: _____ Date: _____

Multiplying and Dividing Rational Expressions Guide Notes

Multiplying and Dividing Rational Expressions

To ***multiply*** and ***divide*** two fractions, make us of the following *theorems:*

$$\frac{a}{b}\times\frac{c}{d}=\frac{ac}{bd}, where\ b\ \neq 0, d\ \neq 0$$

$$\frac{a}{b}\div\frac{c}{d}=\frac{ad}{bc}, where\ b\ \neq 0, d\ \neq 0$$

Sample Problem 1: Multiply the following rational expressions.

1. $\frac{8}{y}\times\frac{y^2}{24}$

2. $\frac{3x}{x^2-4}\times\frac{x+2}{6}$

3. $\frac{3y^3}{2x(a+b)}\times\frac{4x^3(a+b)}{ay^3-by^3}$

4. $\frac{2x-y}{4x^2-4y^2}\times\frac{x^2+2xy+y^2}{2x^2+xy-y^2}$

Sample Problem 2: Divide the following rational expressions.

5. $\frac{7y}{6x}\div\frac{21y}{36x}$

6. $\frac{x}{x+5}\div\frac{x}{x+7}$

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7. $\frac{10ab}{x-3y} \div \frac{-5a^3}{7x-21y}$

8. $\frac{x^2-9}{x^2-25} \div \frac{x-3}{x+5}$

Sample Problem 3: Perform the indicated operation to the following rational expressions.

9. $\frac{12x}{x+y} \div \left(\frac{5x-5}{x^2-y^2} \times \frac{3xy}{xy-y}\right)$

10. $\frac{x^2-25}{x^2-x-12} \div \frac{x^2-x-20}{3x-3} \times \frac{x^2-16}{x^2+4x-5}$