

September 12th, 2008

1.7 Multiplying & Dividing Rational Expressions

Same technique as operations with Rational expression.

Simplify

$$a) \frac{x}{6} \times \frac{3y}{2x}$$

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

$$= \frac{x^2 y}{4}$$

$$x \neq 0$$

$$b) \frac{3a^2(b+2)}{5(a-3)} \times \frac{10(a-3)}{ab}$$

$$= \frac{6a(b+2)}{b}$$

$$b \neq 0$$

$$a \neq 3, 0$$

$$c) \frac{x^2 - x - 6}{x^2 + 8x + 15} \cdot \frac{x+5}{x-3}$$

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

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

$$x \neq -5, -3, 3$$

* MUST have Multiplication to reduce
⇒ FACTOR

Simplify

$$a) \frac{2x^2}{-3} \div \frac{8x^3}{15}$$

← check for restrictions before you invert rational expression also.

$$= \frac{2x^2}{-3} \cdot \frac{15}{8x^3}$$

$$= -\frac{5}{4x}$$

* $x \neq 0$

$$b) \frac{6a-6}{a^2} \div \frac{3a-3}{a^2+2a}$$

$$= \frac{(6a-6)}{a^2} \cdot \frac{a^2+2a}{3a-3}$$

$$= \frac{2(3a-3)}{a^2} \cdot \frac{a^2+2a}{3a-3}$$

$$= \frac{2(a+2)}{a}$$

$$a \neq 1, 0, -2$$

$$c) \frac{6a^2-15a}{a^2-a-12} \div \frac{4a^2-25}{3a+9}$$

$$= \frac{3a(2a-5)}{(a-4)(a+3)} \cdot \frac{3(a+3)}{(2a-5)(2a+5)}$$

$$= \frac{9a}{(a-4)(2a+5)}$$

$$a \neq -3, 4$$

$$a \neq \frac{5}{2}, -\frac{5}{2}$$

$$d) \frac{(2a+5b)^2}{3a-4b} \cdot \frac{16b^2-9a^2}{4a^2-25b^2} \cdot \frac{3a+4b}{2a-5b}$$

$$= \frac{(2a+5b)(2a+5b)}{3a-4b} \times \frac{-(-4b+3a)(4b+3a)}{(2a+5b)(2a-5b)} \times \frac{2a-5b}{3a+4b}$$

$$= -(2a+5b)$$

$$a \neq \frac{4b}{3}, -\frac{5b}{2}, \frac{4b}{3}$$

