

## 2.6 Multiply/Divide Rational Expressions

Mar 3

Simplify and state restrictions.

$$\frac{\overset{3}{\cancel{6}}x^2}{\cancel{5}xy} \times \frac{\overset{3}{\cancel{15}}xy^3}{\cancel{8}xy^4}$$

$$= \frac{9x^3y^3}{4x^2y^5}$$

$$= \frac{9x}{4y^2}, x \neq 0$$

$$\frac{x^2-4}{x^2+12x+36} \times \frac{x^2+9x+18}{4-2x}$$

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

$$= \frac{(x+2)(x+3)}{-2(x+6)}, x \neq 2, -6$$

$$\begin{aligned} 4-2x \\ -2x+4 \\ -2(x-2) \end{aligned}$$

NOT  
NEEDED

$$\begin{aligned}
 & \frac{21x-3x^2}{16x+4x^2} \div \frac{14-9x+x^2}{12+7x+x^2} \\
 & = \frac{21x-3x^2}{16x+4x^2} \times \frac{12+7x+x^2}{14-9x+x^2} \\
 & = \frac{\cancel{3} \times \cancel{(7-x)}}{\cancel{4} \times \cancel{(4+x)}} \times \frac{\cancel{(4+x)}(3+x)}{\cancel{(-2+x)}(-\cancel{7+x})} \\
 & \quad \quad \quad (-1) \\
 & = \frac{3(3+x)}{-4(-2+x)} \quad , x \neq 7, -4, 0
 \end{aligned}$$

MULTIPLY BY  
RECIPROCAL OF  
DIVISION

$$\begin{aligned}
 & \frac{x^3+5x^2-x-5}{x^2-2x-8} \times \frac{5x^2+10x}{x^2-25} \div \frac{2x^4-5x^3-2x^2+5x}{4x^2-4x-15} \\
 & = \frac{x^2(x+5)-(x+5)}{(x+2)(x-4)} \times \frac{5x(x+2)}{(x+5)(x-5)} \div \frac{x^3(2x-5)-(x+5)}{(2x+3)(2x-5)} \\
 & = \frac{\cancel{(x+1)}\cancel{(x-1)}\cancel{(x+5)}}{\cancel{(x+2)}(x-4)} \times \frac{\cancel{5}\cancel{x}\cancel{(x+2)}}{\cancel{(x+5)}(x-5)} \times \frac{(2x+3)\cancel{(2x-5)}}{\cancel{x}\cancel{(x+1)}\cancel{(x-1)}\cancel{(2x-5)}} \\
 & = \frac{5(2x+3)}{(x-4)(x-5)} \quad x \neq \pm 5, -2, -\frac{3}{2}, \pm 1, \\
 & \quad \quad \quad 4, \frac{5}{2}, 0
 \end{aligned}$$

homework p. 121 #1-10,13,14