**12.5: Multiply and Divide Rational Expressions:**

**Goals: \***Multiply expressions involving monomials

 **\***Multiply expressions involving polynomials

 **\***Divide rational expressions

**Multiply expressions involving monomials:**

**Ex:  Ex: **

$\frac{1}{3}$ $\frac{3}{4}$

**Ex:  Ex: **

 $\frac{z}{8}$ $\frac{4x^{3}}{5}$

**Multiply Expressions Involving Polynomials:**

**Ex:  Ex: **

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

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

**Ex:  Ex: **

 $\frac{(x-1)(x+2)}{x(x+2)}∙\frac{2x(x+1)}{5(x-2)(x-1)}$ $\frac{2w^{2}}{(w-4)(w-3)}∙\frac{(w-4)}{1}$

 $\frac{2(x+1)}{5(x-2)}$ $\frac{2w^{2}}{w-3}$

**Ex:  Ex: **

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

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

**Divide Rational Expressions:**

**Ex:  Ex: **

 $\frac{7x(x-1)}{\left(x+3\right)(x-1)}∙\frac{(x-8)(x+1)}{x+1}$ $\frac{(x-3)(x+3)}{(x+3)(x+2)}∙\frac{(x-4)(x+2)}{4x(x-3)}$

 $\frac{7x(x-8)}{x+3}$ $\frac{x-4}{4x}$

**Ex:  Ex: **

 $\frac{(m+2)(m-2)}{2m(m+2)}∙\frac{4(m+11)}{3m(2-m)}$ $\frac{(n-3)(n-3)}{12n}∙\frac{1}{n-3}$

 $\frac{-2(m+11)}{3m^{2}}$ $\frac{n-3}{12n}$

**Ex:  Ex: **

 $\frac{2(x+6)(x+2)}{3x^{2}}∙\frac{1}{x+6}$ $\frac{3(x+2)(x+6)}{3(2x+3)}∙\frac{1}{x+2}$

 $\frac{2(x+2)}{3x^{2}}$ $\frac{x+6}{2x+3}$