

5.2: Multiplying & Dividing Rational Expressions

Steps:

- 1) Factor
- 2) Replace Expressions with their factors
- 3) multiply fractions
- 4) cancel
- 5) Write factors that are left

Ex 1) $\frac{x^2}{x+9} \cdot \frac{x^2+15x+54}{x^2-4x} = \frac{x^2}{(x+9)} \cdot \frac{(x+9)(x+6)}{x(x-4)} = \frac{x(x+6)}{x-4}$

$x^2+15x+54$
 $(x+9)(x+6)$
 $9+6=15$

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

Ex 2) $\frac{5x+15}{x^2-9} \cdot \frac{8x+24}{4} = \frac{5(x+3)}{(x+3)(x-3)} \cdot \frac{8(x+3)}{4} = \frac{10(x+3)}{(x-3)}$

$\frac{5x+15}{5} \frac{1}{5}$
 $5(x+3)$

x^2-9
 $\sqrt{x^2}=x \quad \sqrt{9}=3$
 $(x+3)(x-3)$

$\frac{8x+24}{8} \frac{1}{8}$
 $8(x+3)$

Ex 3) $\frac{x^2 + 9x + 26}{x^2 - 25} \div \frac{x+4}{x-4}$ ↷ flip

↑
keep

↑
change to ·

$$\frac{x^2 + 9x + 26}{x^2 - 25} \cdot \frac{x-4}{x+4} = \frac{(x+5)(x+4)}{(x+5)(x-5)} \cdot \frac{(x-4)}{(x+4)} = \boxed{\frac{x-4}{x-5}}$$

$x^2 + 9x + 26$
 $(x+5)(x+4)$

$\overset{20}{5} + \overset{4}{4} = 9$

$x^2 - 25$
 $\sqrt{x^2} = x \quad \sqrt{25} = 5$
 $(x+5)(x-5)$