

## Multiply and Dividing Rational Expressions:

- I can simplify a rational expression by factoring
- I can simplify a rational expression by multiplication
- I can simplify a rational expression by division. (multiply by reciprocal)
- I can simplify a complex fraction

$$1. \quad \frac{18x^3}{30x^2} = \frac{3x}{5} \quad 2. \quad \frac{81x^2y^5}{243xy^3} = \frac{xy^2}{3} \quad 3. \quad \frac{16a^6b^2}{24a^3b^5}$$

$$4) \quad \frac{7x - 63}{x^2 - 13x + 36} = \frac{7(x-9)}{(x-9)(x-4)} = \frac{7}{(x-4)}$$

$$5) \quad \frac{k^2 - 2k - 3}{k^2 + 4k + 3} = \frac{(k-3)(k+1)}{(k+3)(k+1)} = \frac{(k-3)}{(k+3)}$$

$$6) \quad \frac{x^2 + 4x - 5}{x + 10} \cdot \frac{1}{x - 1}$$

$$7) \quad \frac{2x^2 + 4x}{x^2 - 4x - 12} \cdot \frac{x^2 - 9x + 18}{2x}$$

$$8) \quad \frac{16}{b+5} \cdot \frac{b^2 + 3b - 10}{8b - 16}$$

$$9) \quad \frac{a^2 - 9a + 14}{a - 2} \cdot \frac{a + 10}{a - 7}$$

$$10) \quad \frac{b - 10}{b^2 - 13b + 30} \div \frac{9b - 27}{b^2 + 7b - 30}$$

$$11) \quad \frac{x^2 - 14x + 40}{9x^3 - 36x^2} \div \frac{x^2 - 6x - 40}{2x + 8}$$

$$\frac{(b-10)}{(b-10)(b-3)} \cdot \frac{(b+10)(b-3)}{9(b-3)} = \frac{(b+10)}{9(b-3)}$$

$$\frac{(x-10)(x-4)}{9x^2(x-4)} \cdot \frac{2(x+4)}{(x-10)(x+4)} = \frac{2}{9x^2}$$

$$12) \frac{3a^2 - 3a}{a^2 + 7a - 8} \div \frac{3a}{a^2 + 8a + 15}$$

$$13) \frac{x^2 + 7x - 30}{x^2 + 8x - 20} \div \frac{6x + 6}{x + 1}$$

$$14) \frac{\frac{1}{x}}{\frac{x}{x-5}} = \frac{1}{x} \div \frac{x}{x-5}$$

$$\frac{1}{x} \cdot \frac{x-5}{x}$$

$$= \boxed{\frac{x-5}{x^2}}$$

$$15) \frac{\frac{25}{x^2-9}}{\frac{5}{x-3}} = \frac{25}{x^2-9} \div \frac{5}{x-3}$$

$$= \frac{25}{(x-3)(x+3)} \cdot \frac{(x-3)}{5}$$

$$= \boxed{\frac{5}{x+3}}$$

$$16) \frac{\frac{2}{x^2-4}}{\frac{4}{x-2}}$$

$$17) \frac{\frac{u^2}{u+1}}{\frac{u}{u+1}}$$