

Name Key

Rational Expression Worksheet #5: Simplify/Multiply/Divide

Simplify (remember to factor when necessary).

$$1. \frac{18x^6}{27x^4} \quad x \neq 0$$

$$\frac{2x^2}{3}$$

$$2. \frac{x^2+6x+8}{3x+12} \quad x \neq -4$$

$$\frac{(x+2)(x+4)}{3(x+4)} = \frac{x+2}{3}$$

$$3. \frac{x^2-7x+12}{x^2+2x-15} \quad x \neq -5, 3$$

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

Multiply or divide (remember to factor when necessary).

$$4. \frac{x+3}{x^2-4x+4} \cdot \frac{x^2-x-2}{x^2+4x+3} \quad x \neq 2, -1, -3$$

$$\frac{x+3}{(x-2)(x-2)} \cdot \frac{(x-2)(x+1)}{(x+1)(x+3)} = \frac{1}{x-2}$$

$$5. \frac{x^2-x-12}{3x+9} \div \frac{x^2+x-20}{x+5} \quad x \neq -3, -5, 4$$

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

$$6. \frac{15x^2}{45x^3} \div \frac{5x^6}{9x^4} \quad x \neq 0$$

$$\frac{15x^2}{45x^3} \times \frac{3x^4}{5x^6} = \frac{3}{5x^3}$$

$$7. \frac{6}{x^2-9x+20} \cdot \frac{5x-25}{3x-6} \quad x \neq 4, 5, 2$$

$$\frac{6}{(x-4)(x-5)} \times \frac{5(x-5)}{3(x-2)} = \frac{10}{(x-2)(x-4)}$$

$$8. \frac{6x-12}{4x^2} \cdot \frac{3x^3}{2x-4} \quad x \neq 2, 0$$

$$3 \frac{(x-2)}{4x^2} \cdot \frac{3x^3}{2(x-2)} = \frac{9x}{4}$$

$$9. \frac{3x-21}{x^2-3x-28} \cdot \frac{5x+20}{2x+8} \quad x \neq 7, -4$$

$$\frac{3(x-7)}{(x-7)(x+4)} \times \frac{5(x+4)}{2(x+4)} = \frac{15}{2(x+4)}$$

$$10. \frac{x^2-5x-6}{2x+6} \div \frac{x^2-3x-4}{4x+12} \quad x \neq -3, 4, -1$$

$$\frac{(x-6)(x+1)}{2(x+3)} \times \frac{2(x+3)}{(x-4)(x+1)} = \frac{2(x-6)}{x-4}$$

$$11. \frac{525x^8}{735x^4y^2} \cdot \frac{214xy}{210x^2y^2} \quad x \neq 0, y \neq 0$$

$$\frac{1}{x^4y}$$

$$12. \frac{4x}{x+1} \cdot \frac{x^2-6x-7}{x^2-7x} \quad x \neq -1, 7, 0$$

$$\frac{4x}{x+1} \cdot \frac{(x-7)(x+1)}{x(x-7)} = 4$$

$$13. \frac{6x-30}{x^2-7x+10} \cdot \frac{7x-14}{6x} \quad x \neq 2, 5, 0$$

$$\frac{6(x-5)}{(x-2)(x-5)} \times \frac{7(x-2)}{6x} = \frac{7}{x}$$