

Name Control

Rational Expressions Study Guide.

Simplify.

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

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

2. $\frac{10a^3b}{-15ab^3}$

$$-\frac{2a^2}{3b^2}$$

3. $\frac{36k^3m}{24k^4mn^5}$

$$\frac{3}{2kn^5}$$

Simplify (remember to factor when necessary).

1. $\frac{2x+6}{4x-12}$

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

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

2. $\frac{3x+18}{x^2+6x}$

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

$$= \frac{3}{x}$$

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

$$= \frac{x-1}{x}$$

Multiply the expressions (remember to factor when necessary).

1. $\frac{12x^8}{5 \cdot 25} \cdot \frac{40}{3} = \frac{32x}{15}$

2. $\frac{9x+18}{x^2-2x-8} \cdot \frac{3x-12}{6x}$

$$\frac{9(x+2)}{(x-4)(x+2)} \cdot \frac{3(x-4)}{6x}$$

$$= \frac{9}{2x}$$

Multiply or divide these rational expressions. Show work and **FACTOR!!**

1. $\frac{2a^2b}{8c} \cdot \frac{b}{a} = \frac{2a}{c}$

2. $\frac{x-5}{6} \div \frac{2x-10}{12}$

$$\frac{x-5}{6} \times \frac{12}{2(x-5)}$$

$$= \boxed{2}$$

3. $\frac{5n+15}{4n+8} \cdot \frac{2n+4}{3n+9}$

$$\frac{5(n+3)}{4(n+2)} \cdot \frac{2(n+2)}{3(n+3)}$$

$$\frac{5}{2} \cdot \frac{2}{3}$$

$$= \frac{5}{3}$$

4. $\frac{x^2-x-12}{x-4} \div \frac{2x+6}{x-5}$

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

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

Add or subtract these rational expressions.

$$1. \quad \frac{9}{15x} + \frac{2}{15x} = \frac{11}{15x}$$

$$2. \quad \frac{7x+4}{x^2+3x+2} - \frac{3x-2}{x^2+3x+2}$$

$$= \frac{4x+2}{x^2+3x+2} = \frac{2(x+1)}{(x+1)(x+2)}$$

Add or subtract these rational expressions. Show your common denominators and numerators on this sheet or separate paper. **FACTOR** denominators when possible.

$$1. \quad \frac{5}{8} - \frac{3}{8x} = \frac{5x}{8x} - \frac{3}{8x}$$

$$= \frac{5x-3}{8x}$$

$$2. \quad \frac{2}{4x+12} + \frac{7}{x+3} = \frac{30}{2(x+3)} = \frac{15}{x+3}$$

$$= \frac{2}{4(x+3)} + \frac{7 \cdot 4}{(x+3) \cdot 4}$$

$$\frac{(x+7) \cdot 2}{4(x+3)} - \frac{1}{x+7} \cdot \frac{(x-3)}{(x-3)}$$

$$3. \quad \frac{3}{y+5} + \frac{y}{y^2+7y+10} = \frac{4y+6}{(y+5)(y+2)}$$

$$\frac{2x+14}{(x+7)(x-3)} - \frac{(x-3)}{(x+7)}$$

$$5. \quad \frac{10x-3}{(x+1)(x+5)}$$

Solve each equation for x. SHOW WORK!

$$\frac{2(y+3)}{(y+5)(y+2)}$$

$$\frac{x+17}{(x+7)(x-3)}$$

$$1.) \quad \frac{15}{x-6} + \frac{7x}{x-6} = \frac{-6}{x-6}$$

$$2.) \quad \frac{2x}{3x} - \frac{5}{6} = \frac{5}{2x} = \frac{4x}{6x} - \frac{5x}{6x} = \frac{15}{6x}$$

$$15 + 7x = -6$$

$$7x = -21$$

$$x = -3$$

~~2x/3x - 5/6 = 5/2x~~

$$-x = 15$$

$$x = -15$$

$$3.) \quad \frac{14}{2x-5} + \frac{7x}{2x-5} = \frac{63}{2x-5}$$

$$4.) \quad \frac{2}{x-6} + \frac{7}{x+2} = \frac{4x+2}{x^2-4x-12}$$

$$14 + 7x = 63$$

$$7x = 49$$

$$x = 7$$

$$\frac{2(x+2)}{(x-6)(x+2)} + \frac{7(x-6)}{(x-6)(x+2)} = \frac{4x+2}{x^2-4x-12}$$

$$2x+4 + 7x - 42 = 4x+2$$

$$9x - 38 = 4x+2$$

$$5x = 40 \Rightarrow x = 8$$