Multiplying and Dividing Rational Expressions

Overview of problems

Example Set: A

Simplify the expression

$$\frac{3x}{5} \cdot \frac{1}{2x}$$

$$\frac{4y^2}{7} \div \frac{2y}{6}$$

$$\frac{9x^2}{10x} \cdot \frac{50x^3}{18x}$$

$$\frac{(x+5)}{7} \cdot \frac{2x}{(x+5)}$$

$$\frac{x+1}{2x^2} \div \frac{4x+4}{x}$$

$$\frac{6x-3}{2x+3} \cdot \frac{8x^2+12x}{x-1/2}$$

Example Set: B

Simplify the expression

$$\frac{x^2-3x-4}{4x} \cdot \frac{10}{4x^2-4}$$

$$(y+6)^4 \div \frac{y^2-36}{y^2+36}$$

$$\frac{x^2+x}{2x^2+5x-12} \cdot \frac{x-4}{x^2-x}$$

Example Set: C

$$\frac{3x}{5x+1} \div \frac{5x-1}{x}$$

$$\left(\frac{x^2}{6} \cdot \frac{3x+2}{2}\right) \div \frac{x}{4}$$

$$\frac{x^2+x+1}{x} \div 5x^3+5x^2+x$$

Example Set: D

Simplify the expression

$$16x^2 - 64 \cdot \frac{x^2 + 8x + 16}{x^2 - 16}$$

$$\frac{x^2 + 12x + 35}{x + 1} \div \frac{x^2 + 10x + 25}{x^2 - 1}$$

Example Set: E

$$\frac{x^2 - 9x}{x^2 - 5x - 6} \cdot \frac{x^2 + 3x + 2}{x^2 - 8x - 20}$$

$$\left[\frac{x^2 + 11x}{x - 2} \div (3x^2 + 6x)\right] \cdot \frac{x^2 - 4}{x + 11}$$

Multiplying and Dividing Rational Expressions

Overview of problems- KEY

Example Set: A

Simplify the expression

$\frac{3x}{5} \cdot \frac{1}{2x}$ $\frac{3}{10}$

$\frac{4y^2}{7} \div \frac{2y}{6}$ $\frac{12y}{7}$

$\frac{9x^2}{10x} \cdot \frac{50x^3}{18x}$ $\frac{5x^3}{2}$

$\frac{(x+5)}{7} \cdot \frac{2x}{(x+5)}$ $\frac{2x}{7}$

$\frac{x+1}{2x^2} \div \frac{4x+4}{x}$ $\frac{1}{8x}$

$\frac{6x-3}{2x+3} \cdot \frac{8x^2+12x}{x-1/2}$ $24x$

Example Set: B

Simplify the expression

$$\frac{x^2-3x-4}{4x} \cdot \frac{10}{4x^2-4}$$

$$\frac{5(x-4)}{8x(x-1)}$$

$$(y+6)^4 \div \frac{y^2-36}{y^2+36}$$

$$\frac{(y+6)^3(y^2+36)}{(y-6)}$$

$$\frac{x^2+x}{2x^2+5x-12} \cdot \frac{x-4}{x^2-x}$$

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

Example Set: C

$$\frac{3x}{5x+1} \div \frac{5x-1}{x}$$

$$\frac{3x^2}{25x^2-1}$$

$$\left(\frac{x^2}{6} \cdot \frac{3x+2}{2}\right) \div \frac{x}{4}$$

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

$$\frac{x^2+x+1}{x} \div 5x^3+5x^2+x$$

$$\frac{x^2+x+1}{5x^4+5x^3+x^2}$$

Example Set: D

Simplify the expression

$$\frac{16x^2-64}{1}\cdot\frac{x^2+8x+16}{x^2-16}$$

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

$$\frac{x^2+12x+35}{x+1}\div\frac{x^2+10x+25}{x^2-1}$$

$$\frac{(x+7)(x-1)}{(x+5)}$$

Example Set: E

$$\frac{x^2-9x}{x^2-5x-6}\cdot\frac{x^2+3x+2}{x^2-8x-20}$$

$$\frac{x(x-9)}{(x-6)(x-10)}$$

$$\left[\frac{x^2+11x}{x-2}\div(3x^2+6x)\right]\cdot\frac{x^2-4}{x+11}$$

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