

MULTIPLYING RATIONAL EXPRESSIONS

1. Factor all numerators and denominations COMPLETELY
2. Divide out all common factors
3. Multiply Numerators
4. Multiply Denominators
5. Check for more common factors. Only common factor should be 1

$$\frac{2x^4y^5}{3x^2} \cdot \frac{15x^2}{8x^3y^2}$$

$$\frac{30x^4y^5}{24x^5y^2} = \frac{5xy^3}{4}$$

$$\frac{x^2-64}{2x^2+12x-32} \cdot \frac{6x-12}{4x-16}$$

$$\frac{(x-8)(x+8)}{2(x^2+6x-16)} \cdot \frac{6(x-2)}{4(x-4)}$$

$$\frac{(x-8)(x+8)}{2(x+8)(x-2)} \cdot \frac{6(x-2)}{4(x-4)}$$

$$\frac{3(x-8)}{4(x-4)} \Rightarrow \frac{3(x-8)}{4(x-4)}$$

DIVIDING RATIONAL EXPRESSIONS

1. Factor all numerators and denominations COMPLETELY
2. Take reciprocal of 2nd fraction and change sign to multiplication
3. Divide out all common factors
4. Multiply Numerators
5. Multiply Denominators
6. Check for more common factors. Only common factor is 1.

$$\frac{4x^3}{9x^2y} \div \frac{16}{9y^5}$$

$$\frac{4x^3}{9x^2y} \cdot \frac{9y^5}{16}$$

$$\frac{xy^4}{4}$$

$$\frac{3x-15}{2x^2-x-3} \div \frac{x^2-10x+25}{4x+6}$$

$$\frac{3x-15}{2x^2-x-3} \cdot \frac{4x+6}{x^2-10x+25}$$

$$\frac{3(x-5)}{(2x+3)(x+1)} \cdot \frac{2(2x+3)}{(x-5)(x-5)}$$

$$\frac{6(2x+3)}{(2x-3)(x+1)(x-5)}$$

$$\frac{x \cdot x^7 \cdot 20}{15 \cdot 2x \cdot x^4}$$

$$\frac{20x^8}{30x^5}$$

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

$$\frac{36x^5y^8}{45x^2} \cdot \frac{60}{18y^5}$$

$$\boxed{\frac{8x^3y^3}{3}}$$

$$\frac{x^2}{4} \div \frac{x^4y}{12y^2}$$

$$\frac{x^2}{4} \cdot \frac{12y^2}{x^4y}$$

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

$$\frac{6x^5y^8}{45x^2} \div \frac{6}{15y^5}$$

$$\frac{6x^5y^8}{45x^2} \cdot \frac{15y^5}{6}$$

$$\boxed{\frac{x^3y^{13}}{3}}$$

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

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

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

$$\frac{10-10x}{x^2-6x+8} \cdot \frac{x+3}{5x+15}$$

$$\frac{\cancel{10}(1-x)}{x^2-6x+8} \cdot \frac{x+3}{5\cancel{x}(x+3)}$$

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

$$\frac{x+2}{3x+12} \cdot \frac{x+4}{x^2-4}$$

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

$$\frac{2x^2-7x-4}{x^2-9} \div \frac{4x^2-1}{2x^2-7x+3}$$

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

$$\boxed{\frac{x-4}{x+3}}$$

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

$$\boxed{1}$$

$$\frac{x^2+10x+16}{x^2-6x-16} \div \frac{x+8}{x^2-64}$$

$$\boxed{x+8}$$