

Simplify:  $\frac{2x}{x^2-7x+12} \cdot \frac{x^2-9}{6x^2}$

Step 1: Factor each numerator and denominator completely

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

Step 2: Multiply the numerators and denominators

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

Step 3 Simplify by dividing out common factors

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

Simplify:  $\frac{5x}{x^2+5x+6} \cdot \frac{x^2-4}{10x}$

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

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

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

Simplify:  $\frac{9x^2}{x^2+11x+30} \cdot \frac{x^2-36}{3x^2}$

even  
32-42

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

$$\frac{\cancel{3} \cdot \cancel{3} \cdot \cancel{x} \cdot \cancel{x} \cdot (x-6)(x+6)}{\cancel{3} \cdot \cancel{x} \cdot \cancel{x} \cdot (x+5)(x+6)}$$

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

**Divide rational expressions.**

Step 1. Rewrite the division as the product of the first rational expression and the reciprocal of the second.

Step 2. Factor the numerators and denominators completely.

Step 3. Multiply the numerators and denominators together.

Step 4. Simplify by dividing out common factors.

Divide

$$\frac{16a^7}{3b^5} \div \frac{8a^3}{6b}$$

$$\frac{16a^7}{3b^5} \cdot \frac{6b}{8a^3}$$

$$\frac{96a^7b}{24a^3b^5}$$

$$\frac{4a^4}{b^4}$$

$$\frac{3y+15}{y^7} \div \frac{y+5}{y^2}$$

$$\frac{3y+15}{y^7} \cdot \frac{y^2}{y+5}$$

$$\frac{3(y+5)}{y^7} \cdot \frac{y^2}{y+5}$$

$$\frac{3y^{\cancel{2}}(\cancel{y+5})}{y^{\cancel{7}5}(\cancel{y+5})}$$

$$\frac{3}{y^5}$$

$$\frac{y^2-9}{y^2} \div \frac{y^5+3y^4}{y+2}$$

$$\frac{y^2-9}{y^2} \cdot \frac{y+2}{y^5+3y^4}$$

$$\frac{(y+3)(y-3)}{y^2} \cdot \frac{y+2}{y^4(y+3)}$$

$$\frac{\cancel{(y+3)}(y-3)(y+2)}{y^2 \cdot y^4 \cancel{(y+3)}}$$

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

$$\frac{y^3+3y}{y^2-9} \div \frac{y^2+5y-14}{y^2+4y-21}$$

$$\frac{y^3+3y}{y^2-9} \cdot \frac{y^2+4y-21}{y^2+5y-14}$$

$$\frac{y(y^2+3)}{(y+3)(y-3)} \cdot \frac{(y+7)(y-3)}{(y+7)(y-2)}$$

$$\frac{y(y^2+3)\cancel{(y+7)}\cancel{(y-3)}}{(y+3)\cancel{(y-3)}\cancel{(y+7)}(y-2)}$$

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

$$\frac{x^2-16}{x^2-10x+25} \div \frac{3x-12}{x^2-3x-10}$$

$$\frac{x^2-16}{x^2-10x+25} \cdot \frac{x^2-3x-10}{3x-12}$$

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

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

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

$$\frac{x^2-7x-8}{2x+6} \div \frac{x^2-3x-4}{4x+12}$$

$$\frac{4y+12}{2y-10} \div \frac{y^2-9}{y^2-y-20}$$

$$\frac{2m^2 - 5m - 12}{m^2 - 10m + 24} \div \frac{4m^2 - 9}{m^2 - m + 18}$$

$$\frac{2m^2 - 5m - 12}{m^2 - 10m + 24} \cdot \frac{m^2 - m + 18}{4m^2 - 9}$$

$$\frac{\cancel{(2m+3)}\cancel{(m-4)}}{(m-6)\cancel{(m-4)}} \cdot \frac{m^2 - m + 18}{(2m-3)\cancel{(2m+3)}}$$

$$\frac{m^2 - m + 18}{(m-6)(2m-3)}$$

49  
43-~~33~~  
odd



Divide:  $\frac{\frac{6x^2-7x+2}{4x-8}}{\frac{2x^2-7x+3}{x^2-5x+6}}$  •

Simplify:  $\frac{\frac{y^2-36}{2y^2+11y-6}}{\frac{2y^2-2y-60}{8y-4}}$ .

Simplify:  $\frac{\frac{y^2-36}{2y^2+11y-6}}{\frac{2y^2-2y-60}{8y-4}}$  .

Perform the indicated operations:  $\frac{3x-6}{4x-4} \cdot \frac{x^2+2x-3}{x^2-3x-10} \div \frac{2x+12}{8x+16}$ .

Perform the indicated operations:  $\frac{4m+4}{3m-15} \cdot \frac{m^2-3m-10}{m^2-4m-32} \div \frac{12m-36}{6m-48}$ .

Perform the indicated operations:  $\frac{2n^2+10n}{n-1} \div \frac{n^2+10n+24}{n^2+8n-9} \cdot \frac{n+4}{8n^2+12n}$ .