

Simplify the complex rational expression by writing it as division: $\frac{\frac{6}{x-4}}{\frac{3}{x^2-16}}$.

$$\frac{6}{x-4} \div \frac{3}{x^2-16}$$

$$\frac{6}{x-4} \cdot \frac{x^2-16}{3}$$

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

Simplify the complex rational expression by writing it as division: $\frac{\frac{2}{x^2-1}}{\frac{3}{x+1}}$.

Simplify the complex rational expression by writing it as division: $\frac{\frac{1}{x^2-7x+12}}{\frac{2}{x-4}}$

Simplify the complex rational expression by using the LCD: $\frac{\frac{1}{x} + \frac{1}{y}}{\frac{x}{y} - \frac{y}{x}}$.

$$\frac{\frac{(y)1}{(y)x} + \frac{1(x)}{y(x)}}{\frac{(x)x}{(x)y} - \frac{y(y)}{x(y)}} = \frac{\frac{y}{xy} + \frac{x}{xy}}{\frac{x^2}{xy} - \frac{y^2}{xy}} = \frac{\frac{x+y}{xy}}{\frac{x^2-y^2}{xy}}$$

$$\frac{x+y}{xy} \div \frac{x^2-y^2}{xy}$$

$$\frac{x+y}{xy} \cdot \frac{xy}{x^2-y^2} = \frac{\cancel{xy} \cancel{xy}}{\cancel{xy} \cancel{xy} (x+y)(x-y)} = \frac{1}{x-y}$$

Simplify the complex rational expression by using the LCD: $\frac{\frac{1}{x^2} - \frac{1}{y^2}}{\frac{1}{x} + \frac{1}{y}}$.

$$\frac{\frac{1}{x^2} - \frac{1}{y^2}}{\frac{1}{x} + \frac{1}{y}} = \frac{\frac{y^2}{x^2y^2} - \frac{x^2}{x^2y^2}}{\frac{y}{xy} + \frac{x}{xy}} = \frac{\frac{y^2 - x^2}{x^2y^2}}{\frac{y+x}{xy}}$$

$$\frac{y^2 - x^2}{x^2y^2} \cdot \frac{xy}{y+x} = \frac{(y-x)(\cancel{y+x})}{x^2y^2} \cdot \frac{\cancel{xy}}{\cancel{y+x}}$$

$$\frac{y-x}{xy}$$

Simplify the complex rational expression by using the LCD: $\frac{\frac{2}{x+6}}{\frac{4}{x-6} - \frac{4}{x^2-36}}$.

$$\frac{\frac{2}{x+6}}{\frac{4(x+6)}{x-6} - \frac{4}{x^2-36}} = \frac{\frac{2}{x+6}}{\frac{4x+24}{(x-6)(x+6)} - \frac{4}{(x-6)(x+6)}}$$

$$= \frac{\frac{2}{x+6}}{\frac{4x+20}{(x+6)(x-6)}}$$

$$\frac{2}{x+6} \cdot \frac{(x+6)(x-6)}{4(x+5)} = \frac{x-6}{2(x+5)}$$

Simplify the complex rational expression by using the LCD: $\frac{\frac{3}{x+2}}{\frac{5}{x-2} - \frac{3}{x^2-4}}$.

$$\frac{\frac{3}{x+2}}{\frac{5}{x-2} - \frac{3}{(x-2)(x+2)}} = \frac{\frac{3}{x+2}}{\frac{5x+10}{(x+2)(x-2)} - \frac{3}{(x+2)(x-2)}}$$

$$= \frac{\frac{3}{x+2}}{\frac{5x+7}{(x+2)(x-2)}} \quad \frac{3}{x+2} \cdot \frac{(x+2)(x-2)}{5x+7}$$

$$\frac{3(x-2)}{5x+7}$$

Simplify the complex rational expression by using the LCD: $\frac{\frac{2}{x-7} - \frac{1}{x+7}}{\frac{6}{x+7} - \frac{1}{x^2-49}}$.

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

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

$$\frac{\frac{6(x-7)}{x+7} - \frac{1}{(x+7)(x-7)}}{\frac{6x-42}{(x+7)(x-7)} - \frac{1}{(x+7)(x-7)}}$$

$$\frac{\frac{x+21}{\cancel{(x+7)}\cancel{(x-7)}} \cdot \frac{\cancel{(x+7)}\cancel{(x-7)}}{6x-43}}{\frac{6x-43}{(x-7)(x+7)}} = \frac{x+21}{6x-43}$$

Simplify the complex rational expression by using the LCD: $\frac{\frac{4}{m^2-7m+12}}{\frac{3}{m-3} - \frac{2}{m-4}}$.

Simplify the complex rational expression by using the LCD: $\frac{\frac{4y}{y+5} + \frac{2}{y+6}}{\frac{3y}{y^2+11y+30}}$.

Simplify the complex rational expression by using the LCD: $\frac{\frac{y}{y+1}}{1+\frac{1}{y-1}}$.

Simplify the complex rational expression by using the LCD: $\frac{1 + \frac{1}{x-1}}{\frac{3}{x+1}}$.