Objective: Simplify Rational Expressions

Simplify each expression. All exponents in simplified form should be positive.

$$\frac{x+2}{x^2-25} - \frac{3x}{x^2+4x-5}$$

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$$\frac{x+2}{x^2-25} - \frac{3x}{x^2+4x-5}$$

$$LCD = (x-5)(x+5)(x-1)$$

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

$$\frac{x^2+x-2}{(x-5)(x+5)(x-1)} - \frac{(3x^2-15x)}{(x-5)(x+5)(x-1)}$$

$$\frac{x^2+x-2-3x^2+15x}{(x-5)(x+5)(x-1)}$$

$$\boxed{\frac{-2x^2+16x-2}{(x-5)(x+5)(x-1)}}$$

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Simplify each expression. All exponents in simplified form should be positive.

$$\frac{14}{x+7} + \frac{14}{x-7}$$

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$$\frac{14}{x+7} + \frac{14}{x-7}$$

$$LCD = (x+7)(x-7)$$

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

$$\frac{14x-98}{(x+7)(x-7)} + \frac{14x+98}{(x+7)(x-7)}$$

$$\boxed{\frac{28x}{(x+7)(x-7)}}$$

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Simplify each expression. All exponents in simplified form should be positive.

$$\frac{6x}{2x + 2x^2} + \frac{x}{x - x^3}$$

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Simplify each expression. All exponents in simplified form should be positive.

$$\frac{6x}{2x + 2x^2} + \frac{x}{x - x^3}$$

$$\frac{\overset{3}{\cancel{6x}}}{2\cancel{x}(1+x)} + \frac{\overset{1}{\cancel{x}}}{\cancel{x}(1-x^2)}$$

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

$$LCD = (1+x)(1-x)$$

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

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

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

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$$\left(\frac{1}{b} + \frac{1}{g}\right)^{-1}$$

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$$\left(\frac{1}{b} + \frac{1}{g}\right)^{-1}$$

$LCD = bg$

$$\left(\frac{1}{b} \cdot \frac{g}{g} + \frac{1}{g} \cdot \frac{b}{b}\right)^{-1}$$

$$\left(\frac{g}{bg} + \frac{b}{bg}\right)^{-1}$$

$$\left(\frac{g+b}{bg}\right)^{-1}$$

$$\boxed{\frac{bg}{g+b}}$$

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Simplify each expression. All exponents in simplified form should be positive.

$$\frac{x^3 + 5x^2 - 4x - 20}{(x-2)(x^2 + 6x + 5)}$$

Objective: Simplify Rational Expressions

Simplify each expression. All exponents in simplified form should be positive.

$$\frac{x^3 + 5x^2 - 4x - 20}{(x - 2)(x^2 + 6x + 5)}$$

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

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

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

$$\boxed{\frac{x+2}{x+1}}$$

Objective: Simplify Rational Expressions

Simplify each expression. All exponents in simplified form should be positive.

$$\frac{x^8 y^3 z (x y^4 z)^2}{x^6 y^{10} z^5}$$

Objective: Simplify Rational Expressions

Simplify each expression. All exponents in simplified form should be positive.

$$\frac{x^8 y^3 z (xy^4 z)^2}{x^6 y^{10} z^5}$$

$$\frac{x^8 y^3 z \cdot x^2 y^8 z^2}{x^6 y^{10} z^5}$$

$$\frac{x^{10} y^{11} z^3}{x^6 y^{10} z^5}$$

$$\boxed{\frac{x^4 y}{z^2}}$$

Objective: Simplify Rational Expressions

Simplify each expression. All exponents in simplified form should be positive.

$$\frac{(x^9 + y^9)(x^{18} - y^{18})}{x^9 - y^9}$$

Objective: Simplify Rational Expressions

Simplify each expression. All exponents in simplified form should be positive.

$$\frac{(x^9+y^9)(x^{18}-y^{18})}{x^9-y^9}$$

$$\frac{(x^9+y^9)\left(\left(x^9\right)^2-\left(y^9\right)^2\right)}{(x^9-y^9)}$$

$$\frac{(x^9+y^9)(x^9+y^9)(x^9-y^9)}{(x^9-y^9)}$$

$$(x^9+y^9)(x^9+y^9)$$

$$\boxed{(x^9+y^9)^2}$$

Objective: Simplify Rational Expressions

Simplify each expression. All exponents in simplified form should be positive.

$$\frac{2x^2 - 18}{x^4 - x^2} \div \frac{4x + 12}{x^2 - x}$$

Objective: Simplify Rational Expressions

Simplify each expression. All exponents in simplified form should be positive.

$$\frac{2x^2 - 18}{x^4 - x^2} \div \frac{4x + 12}{x^2 - x}$$

$$\frac{2x^2 - 18}{x^4 - x^2} \cdot \frac{x^2 - x}{4x + 12}$$

$$\frac{2(x^2 - 9)}{x^2(x^2 - 1)} \cdot \frac{x(x - 1)}{4(x + 3)}$$

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

$x \qquad\qquad\qquad 2$

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