

Rational Expressions Worksheet

Reducing Rational Expressions

1. Reduce $\frac{x^2 - 9}{x - 3}$

2. Reduce $\frac{y^2 - 5y - 6}{y^2 - 1}$

3. Reduce $\frac{x^2 - 3x + ax - 3a}{x^2 - ax - 3x + 3a}$

4. Reduce $\frac{a - b}{b - a}$

5. Reduce $\frac{x^2 - 25}{5 - x}$

6. Reduce $\frac{2x^3 + 2x^2 - 24x}{x^3 + 2x^2 - 8x}$

Multiplying and Dividing Expressions

1. Multiply $\frac{8x^3}{27y^8} \cdot \frac{9y^3}{12x^2}$

2. Multiply $\frac{x - 3}{x^2 - 4} \cdot \frac{x + 2}{x^2 - 6x + 9}$

3. Divide $\frac{3x-9}{x^2-x-20} \cdot \frac{x^2+2x-15}{x^2-25}$

4. Multiply $(x^2-49)\left(\frac{x+4}{x+7}\right)$

5. Multiply $a(a+5)(a-5)\left(\frac{a+4}{a^2-5a}\right)$

Adding and Subtracting Expressions

1. Add $\frac{-2}{x^2-2x-3} + \frac{3}{x^2-9}$

2. Add $\frac{x}{x^2-1} + \frac{1}{x^2-1}$

3. Subtract $\frac{x+4}{2x+10} - \frac{5}{x^2-25}$

4. Add $\frac{5}{x} + \frac{3}{x}$

Complex Expressions

1. Simplify $\frac{\frac{3}{4}}{\frac{5}{8}}$

2. Simplify $\frac{\frac{x-2}{x^2-9}}{\frac{x^2-4}{x+3}}$

3. Simplify $2 - \frac{3}{x + \frac{1}{3}}$

4. Simplify $\frac{x + \frac{1}{y}}{y + \frac{1}{x}}$

Graphing Rational Functions

1. Graph each equation.

a. $y = \frac{1}{x}$

b. $y = \frac{-1}{x}$

2. Graph each equation.

a. $y = \frac{6}{x-2}$

b. $y = \frac{6}{x+2}$

3. Examine horizontal asymptotes.

4. Graph $y = \frac{x-4}{x-2}$

5. Graph $y = \frac{3x-1}{2x+1}$

Rational Equations

1. Solve for a: $\frac{6}{a-4} = \frac{3}{8}$

2. Solve for x: $\frac{x}{x-2} + \frac{2}{3} = \frac{2}{x-2}$

3. Solve for x: $\frac{5}{x^2-3x+2} - \frac{1}{x-2} = \frac{1}{3x-3}$

4. Solve for x: $3 + \frac{1}{x} = \frac{10}{x^2}$

5. Solve for y: $x = \frac{y-4}{y-2}$