

Multiplying and Dividing Rational Expressions

A rational expression is _____.

The domain is all real numbers except those for which the denominator is _____.

Simplifying Rational Expressions

Examples: Simplify and give the domain.

1. $\frac{x^3 - 5x^2 - 24x}{x^3 + x^2 - 72x}$

2. $\frac{3x^5 - 18x^4 - 21x^3}{2x^6 - 98x^4}$

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

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

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

Multiplying and Dividing Rational Expressions

Examples: Multiply or Divide (and give the domain).

6. $\frac{2xy}{z} \cdot \frac{3x^2}{4yz}$

7. $\frac{5x}{x+3} \cdot \frac{x^2+x-6}{x^2+2x+1} \cdot \frac{x^2+x}{5x-10}$

$$8. \frac{x^2-16}{9-x} \cdot \frac{x^2+x-90}{x^2+14x+40}$$

$$9. \frac{x+2}{x^4-16} \cdot x^3 + 4x^2 - 12x$$

$$10. \frac{2x^2-12x}{x+5} \div \frac{x-6}{x+5}$$

$$11. \frac{1}{x^2+9x} \div \frac{6-x}{3x^2-18x}$$