

1. Simplify the expression:

(a) $6y^0(3y^2)^{-1}$

(b) $\frac{4^2b^3c^{-3}}{(2a)^3b^2c^0}$

2. Completely factor the polynomial:

(a) $3x^2 + 7x - 6$

(b) $x^3 - 6x^2 - 4x + 24$

3. Find all solutions to the equations:

(a) $x^6 - 7x^3 + 6 = 0$

(b) $x - 5 = 4\sqrt{x}$

(c) $\sqrt[3]{2x + 3} + 1 = 0$

4. Find the Domain of the given functions:

(a) $f(x) = 13$

(b) $f(x) = \frac{1}{x^2 - 3x}$

(c) $f(x) = \sqrt{4 - x}$

5. Write an equation for a line the satisfies the given characteristics:

(a) passes through the points (5,2) and (3,3)

(b) passes through the points (-3,2) and (-3,7)

(c) passes through (3,-2) perpendicular to $y = -\frac{1}{2}x - 6$

6. Find the following compositions of:

$$f(x) = x^2 - 3x + 4 \quad \text{and} \quad g(x) = x - 3$$

(a) $f \circ g$

(b) $g \circ g$

7. For each function find its inverse:

(a) $f(x) = \sqrt[3]{x + 5}$

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