

Chapter 1

Solve the equation.

1. $6x^2 - 11x = 7$

2. $\frac{4x}{x-2} + \frac{3}{x} = \frac{-6}{x^2 - 2x}$

3. $|4x + 3| = 7$

Use the discriminant to determine the number and nature of solutions.

4. $3x^2 + 2x + 2 = 0$

5. $9x^2 - 12x - 4 = 0$

6. A shopping center has a rectangular area of 40,000 yd² enclosed on three sides for a parking lot. The length is 200 yd more than twice the width. What are the dimensions of the lot?

7. An ecology center wants to set up an experimental garden using 300 m of fencing to enclose a rectangular area of 5000 m². Find the dimensions of the garden.

Solve for x.

8. $\sqrt{3x + 4} + 4 = 2x$

9. $(8x + 3i)^2 = 0$

Solve and graph the inequality. Give your answer in interval notation.

10. $-2(x - 1) - 10 < 2(x + 2)$

11. $-2 \leq \frac{1}{2}x + 3 \leq 4$

12. $\frac{x + 1}{x - 3} < 5$

Chapter 2

Write the equation of the line.

13. Through (3, -4), parallel to the line $3x + 4y = 8$

14. Through (3, -4) perpendicular to the line $3x + 4y = 8$

15. Find $f(4)$ for the piece-wise function defined as

$$f(x) = \begin{cases} 5x - 4 & \text{if } x \leq 1 \\ x & \text{if } x > 1 \end{cases}$$

16. Give the domain and range of the relation $y = (x + 7)^2 - 3$

17. For $f(x) = 2x^2 - 3x + 2$ and $g(x) = -2x + 1$, find $(f \circ g)(x)$

Chapter 3

18. Identify the vertex of the following parabolas.

a. $y = 3(x + 4)^2 - 5$

b. $y = -3x^2 - 12x - 1$

19. Divide. $\frac{3x^5 - 1}{x - 1}$

20. Factor into linear factors given that k is a zero of $f(x)$: $f(x) = 2x^3 - 3x^2 - 17x + 30$; $k = 2$