CHAPTER 5

Mid-Chapter Quiz

Lessons 5-1 through 5-4

1. Find the y-intercept, the equation of the axis of symmetry, and the x-coordinate of the vertex for $f(x) = 3x^2 - 12x + 4$. Then graph the function by making a table of values. (Lesson 5-1)

2. **MULTIPLE CHOICE** For which function is the x-coordinate of the vertex at 4? (Lesson 5-1)

   A $f(x) = x^2 - 8x + 15$

   B $f(x) = -x^2 - 4x + 12$

   C $f(x) = x^2 + 6x + 8$

   D $f(x) = -x^2 - 2x + 2$

3. Determine whether $f(x) = 3 - x^2 + 5x$ has a maximum or minimum value. Then find this maximum or minimum value and state the domain and range of the function. (Lesson 5-1)

4. **BASEBALL** From 2 feet above home plate, Grady hits a baseball upward with a velocity of 36 feet per second. The height $h(t)$ of the baseball t seconds after Grady hits it is given by $h(t) = -16t^2 + 36t + 2$. Find the maximum height reached by the baseball and the time that this height is reached. (Lesson 5-1)

5. Solve $2x^2 - 11x + 12 = 0$ by graphing. If exact roots cannot be found, state the consecutive integers between which the roots are located. (Lesson 5-2)

NUMBER THEORY **Use a quadratic equation to find two real numbers that satisfy each situation, or show that no such numbers exist.** (Lesson 5-2)

6. Their sum is 12, and their product is 20.
7. Their sum is 5 and their product is 9.

8. **MULTIPLE CHOICE** For what value of x does $f(x) = x^2 + 5x + 6$ reach its minimum value? (Lesson 5-2)

   F -5 H $-\frac{5}{2}$

   G -3 J -2

9. **FOOTBALL** A place kicker kicks a ball upward with a velocity of 32 feet per second. Ignoring the height of the kicking tee, how long after the football is kicked does it hit the ground? Use the formula $h(t) = v_0 t - 16t^2$ where $h(t)$ is the height of an object in feet, v_0 is the object's initial velocity in feet per second, and t is the time in seconds. (Lesson 5-2)

Solve each equation by factoring. (Lesson 5-3)

10. $2x^2 - 5x - 3 = 0$
11. $6x^2 + 4x - 2 = 0$
12. $3x^2 - 6x - 24 = 0$
13. $x^2 + 12x + 20 = 0$

REMODELING **For Exercises 14 and 15, use the following information.** (Lesson 5-3)

Sandy'closet was supposed to be 10 feet by 12 feet. The architect decided that this would not work and reduced the dimensions by the same amount x on each side. The area of the new closet is 63 square feet.

14. Write a quadratic equation that represents the area of Sandy's closet now.
15. Find the new dimensions of her closet.

16. Write a quadratic equation in standard form with roots -4 and $\frac{1}{3}$. (Lesson 5-3)

Simplify. (Lesson 5-4)

17. $\sqrt{-49}$
18. $\sqrt{-36a^3b^4}$
19. $(28 - 4i) - (10 - 30i)$
20. i^{89}
21. $(6 - 4i)(6 + 4i)$
22. $\frac{2 - 4i}{1 + 3i}$

23. **ELECTRICITY** The impedance in one part of a series circuit is $2 + 5j$ ohms and the impedance in another part of the circuit is $7 - 3j$ ohms. Add these complex numbers to find the total impedance in the circuit. (Lesson 5-4)

Series Circuit

Number of Bulbs	Current	Brightness
1	3.67	brightest
2	1.84	bright
3	1.22	dim