Date Completed: _____
Mentor Initials: _____

Calculator

Note: Use a graphing calculator for ALL questions.

Multiple Choice (Calculator)

1. What is the y-coordinate of the y-intercept of the graph of $y = 4^x + 7$?

A) 0

B) 1

C) 7

D) 8

2.

$$2x - \frac{3}{2}y = 1$$

$$4x - 3y = 1$$

How many solutions does the given system of equations have?

A) Zero

B) Exactly one

C) Exactly two

D) Infinitely many

3. The graph of the line $y = -\frac{3}{2}x + 5$ in the xy-plane is translated 2 units to the left. What is the y-intercept of the translated line?

A) $(0, 2)$

B) $(0, 3)$

C) $(0, 5)$

D) $(0, 7)$

4. $x^2 - 4x + d = 0$

In the given equation, d is a constant. If the equation has exactly one solution, what is the value of d?

A) -4

B) 0

C) 1

D) 4

5. Which of the following is equivalent to the expression $x^4 - 18x^2 + 81$?

I. $(x + 3)^2(x - 3)^2$

II. $(x^2 + 9)^2$

A) I only

B) II only

C) I and II

D) Neither I nor II

6. The function $y = f(x)$ is graphed in the xy-plane and touches the x-axis at 4 distinct points. Which of the following could define the function f?

A) $f(x) = x^4$

B) $f(x) = (x - 4)^3$

C) $f(x) = (x - 3)^2(x - 4)(x + 4)$

D) $f(x) = x^2(x - 2)^2(x - 3)(x + 1)$

7. In the standard (x, y) coordinate plane, given Parabola A with equation $y = 2x^2$, Parabola B is the image of Parabola A after a shift of 6 coordinate units to the left and 5 coordinate units down. Parabola B has which of the following equations?

A) $y = 2(x + 5)^2 + 6$

B) $y = 2(x - 6)^2 - 5$

C) $y = 2(x - 6)^2 + 5$

D) $y = 2(x + 6)^2 - 5$

8. The statement $4x - (x - 6) + 7 = 3x + 13$ is true for:

A) $x = 0$ only.

B) $x = 6$ only.

C) no values of x.

D) all values of x.

9. Which of the following expressions is a factor of $3x^2 - 17x + 10$?

I. $x - 5$

II. $3x - 2$

A) I only

B) II only

C) I and II

D) Neither I nor II

10. $x^2 + p = 0$

In the quadratic equation shown, p is a constant. For which of the following values of p will the equation have no real solutions?

A) -3

B) -2

C) 0

D) 3

Grid-In (Calculator)

11. In the xy-plane, the graph of $y = (x + 6)^2 + 5$ is the image of the graph of $y = (x - 4)^2 + 5$ after a translation of how many units to the left?

12. $f(x) = 3x^2 - 4x + 5$

For the function f shown, for what value of x does $f(x)$ obtain its minimum value?

13. $f(x) = x^2(x - 4)(x + 3)(x - 4)$

In the xy-plane, at how many points does the graph of the given function f intersect the x-axis?

14. How many solutions does the equation $|x - 3| = -6$ have?

15. $y = -12x^2 + 60x + 72$

The equation above gives the height of a ball above the ground, y, in feet, x seconds after it is thrown from a building. How many seconds after it is thrown does the ball reach the ground?