Date Completed: _____
Mentor Initials: _____

Sketch

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Multiple Choice (No Calculator)

1. $$y = (x - 3)^2 + 7$$

The equation above can be represented by a parabola in the xy-plane. The parabola is then translated so that the vertex is at $(0,0)$. Which of the following best describes the translation?

A) 3 units in the negative x direction and 7 units in the negative y direction

B) 3 units in the negative x direction and 7 units in the positive y direction

C) 3 units in the positive x direction and 7 units in the positive y direction

D) 3 units in the positive x direction and 7 units in the negative y direction

2. In the xy-plane, an equation of Circle D is $(x - 1)^2 + y^2 = 1$. Circle E is obtained by shifting Circle D one unit to the right. Which of the following is an equation of Circle E ?

A) $x^2 + y^2 = 1$

B) $(x - 2)^2 + y^2 = 1$

C) $(x - 1)^2 + (y - 1)^2 = 1$

D) $(x - 1)^2 + (y + 1)^2 = 1$

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

In the equation above, l is a constant. If the equation has no real solutions, which of the following could be the value of l ?

A) -5

B) -4

C) 4

D) 5

4. What is the maximum value of $f(x) = -(x-h)^2 + k - j$ for each set of positive real numbers, $h, k,$ and j ?

A) $-j$

B) k

C) $-k-j$

D) $k-j$

5. Which of the following equations has a graph in the xy-plane with no x-intercepts?

A) $y = 3 * 2^x$

B) $y = 3x - 5$

C) $y = x^2 + 2x - 3$

D) $y = 3(x-2)^2 - 4$

Grid-In (No Calculator)

6. A square is inscribed in a circle with radius $3\sqrt{2}$ inches. What is the area of the square in inches?

7. The equation $(x+3)^2 + (y-7)^2 = 10$ is that of a circle that lies in the standard (x, y) coordinate plane. One endpoint of a diameter of the circle has y-coordinate 10. What is the y-coordinate of the other endpoint of that diameter?

8. Ray RT bisects $\angle QRS$, the measure of $\angle QRS$ is $12x$, and the measure of $\angle QRT$ is $(3x+30)°$. What is the measure of $\angle TRS$?

9.

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

If the given equations are graphed in the xy-plane, at how many points do the graphs intersect?

10. Triangle DEF has right angle E. If $\tan F = \frac{4}{3}$, what is the value of $\cos D$?