NAME _____   **DATE** _____

Module Test Ⓐ   Module 14

Determine the direction each parabola opens by inspection.

1. $y = 2x^2 - x - 3$ _____

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

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

4. $y = (x - 5)^2 + 1$ _____

5. $x = 4y^2 + 4y - 15$ _____

6. $x = -y^2$ _____

7. $x = 6(y - 1)^2 + 7$ _____

8. $y = -3x^2 + 1$ _____

9. Given the equation of the parabola $y = 2x^2 + 4x - 1$, answer the following:

a. Find the axis of symmetry using the Axis of Symmetry Formula.

b. Identify the vertex.

_____

_____

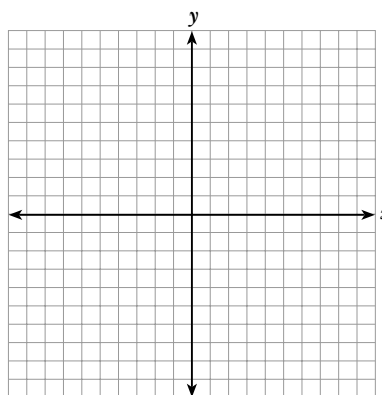**c.** Find four other points on the graph.

d. Graph the parabola.

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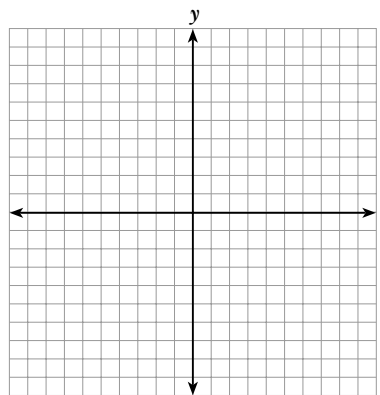
10. Given the equation of the parabola $y = -x^2 + 3x - 2$, answer the following:

a. Find the axis of symmetry using the Axis of Symmetry Formula.

b. Identify the vertex.

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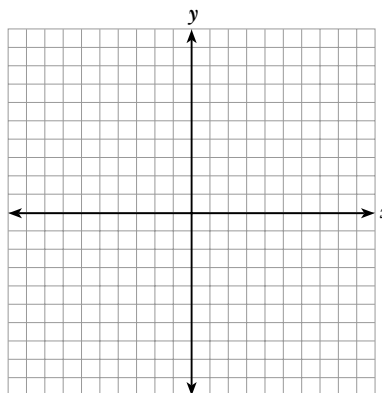**c.** Find four other points on the graph.

d. Graph the parabola.

11. **Given the equation of the parabola $x = y^2 - 6y + 1$, answer the following:**

a. Complete the square to write the equation in the form $x = a(y - k)^2 + h$.

b. Identify the vertex.

c. Find four other points on the graph.

d. Graph the parabola.

12. **Determine whether each statement is true or false.**

a. The graph of $y = 3x^2$ is narrower than the graph of $y = x^2$.

b. The graph of $y = 2x^2$ is narrower than the graph of $y = -2x^2$.

c. The graph of $x = -3y^2 + 2y - 1$ is wider than the graph of $x = -y^2 + y + 5$.

d. The graph of $x = 0.5y^2 + 6y$ is wider than the graph of $x = y^2$.

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13. A rocket is fired into the air from atop a building; its height is given by the equation $h = -16t^2 + 96t + 25$, where h is the height in feet and t is time in seconds, as shown by the graph.
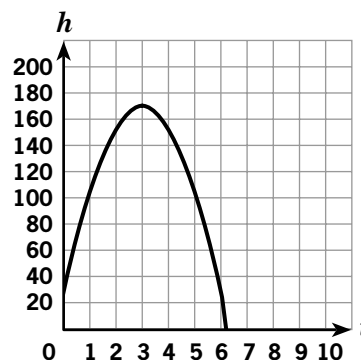
a. What was the height of the building?

_____

b. At what velocity was the rocket fired?

_____

c. Using the graph, when does the rocket reach its maximum height?

_____

d. Find the exact maximum height of the rocket algebraically.

_____

e. Using the graph, approximately how long was the rocket in flight?

_____

14. The vertex of the equation $y = -3x^2 + 6x - 4$ is _____.

a. (0, –2)　　　**b.** (1, –4)　　　**c.** (1, –1)　　　**d.** (2, –4)

15. The height of a dart thrown at a dartboard is modeled by the equation $h = -16t^2 + 6t + 5.5$, where h is in feet and t is in seconds. About how high was the dart's maximum height?

a. 5.5 feet　　　**b.** 6 feet　　　**c.** 6.6 feet　　　**d.** 7 feet

Answer the following questions:

16. Compare the graphs of $y = 3(x - 1)^2 + 2$ and $y = -(x - 1)^2 + 2$.

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17. Explain why the quadratic relation $y = 2(x - 1)^2 + 3$ is a function.

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