

Math 1010 - Intermediate Algebra
9.6 More About Parabolas and Their Applications

Name _____

Score _____

In 1-4, Complete the square to find the vertex of each parabola.

1. $f(x) = x^2 + 8x + 10$

2. $f(x) = x^2 - 10x + 23$

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

4. $f(x) = -3x^2 + 12x - 8$

In 5-8, Use the vertex formula to find the vertex of each parabola.

5. $f(x) = x^2 + 2x - 7$

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

7. $f(x) = 3x^2 - 6x + 4$

8. $f(x) = -x^2 + 7x + 2$

In 9-12, Find the discriminant and use it to determine the number of x -intercepts of the graph of each quadratic function.

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

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

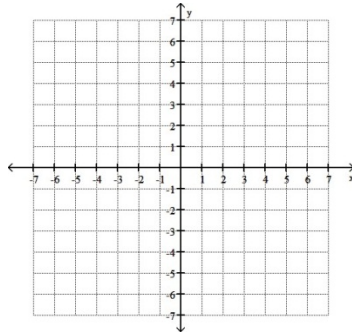
11. $f(x) = 4x^2 - 12x + 9$

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

In 13-20, graph each parabola. Give the vertex, axis of symmetry, the domain and the range.

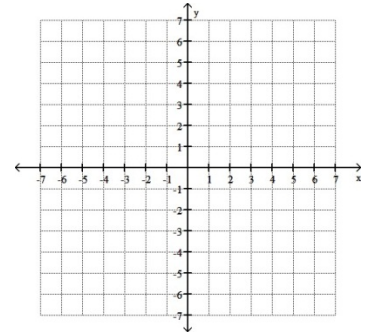
13. $f(x) = x^2 - 6x + 5$

Vertex: _____
Axis: _____
domain: _____
range: _____



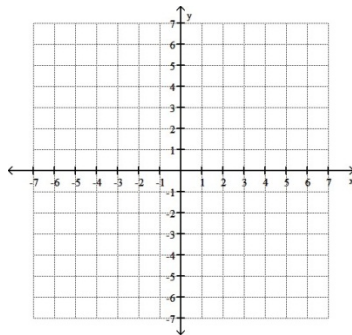
14. $f(x) = -2x^2 - 4x + 6$

Vertex: _____
Axis: _____
domain: _____
range: _____



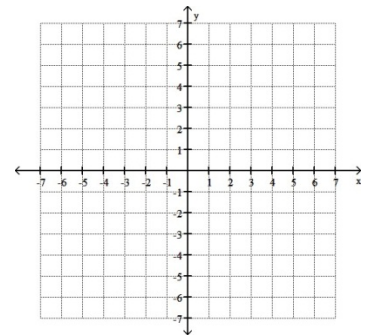
15. $f(x) = -x^2 + 10x - 21$

Vertex: _____
Axis: _____
domain: _____
range: _____



16. $f(x) = 3x^2 - 12x + 15$

Vertex: _____
Axis: _____
domain: _____
range: _____



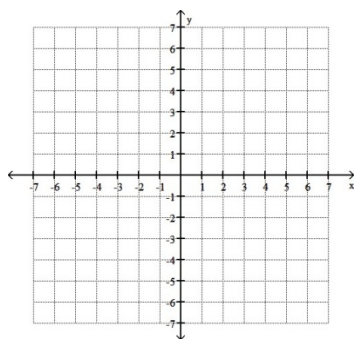
$$17. x - 4 = -4(y + 2)^2$$

Vertex: _____

Axis: _____

domain: _____

range: _____



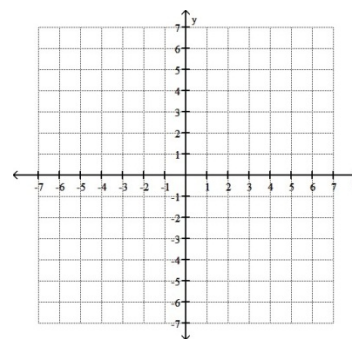
$$18. x = y^2 + 4y + 4$$

Vertex: _____

Axis: _____

domain: _____

range: _____



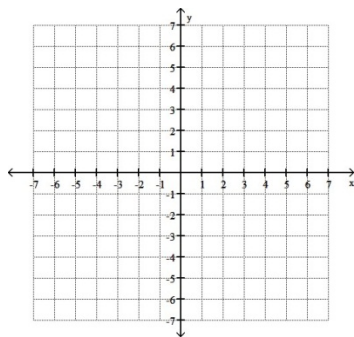
$$19. x = 3y^2 - 6y + 3$$

Vertex: _____

Axis: _____

domain: _____

range: _____



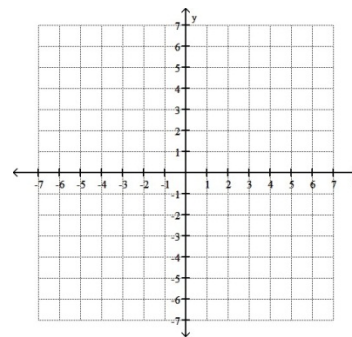
$$20. x = -3y^2 + 6y - 5$$

Vertex: _____

Axis: _____

domain: _____

range: _____



In 21-24, solve each problem.

21. A College is planning to construct a rectangular parking lot on land bordered on one side by a highway. The plan is to use 640 feet of fencing to fence off the other three sides. What dimension should the lot have if the enclosed area is to be a maximum?
22. If a baseball is projected upward from ground level with an initial velocity of 96 feet per second, then its height is a function of time, given by $s = -16t^2 + 96t$. What is the maximum height reached by the ball?
23. Morgan's Department Store wants to construct a rectangular parking lot on land bordered on one side by a highway. It has 280 ft of fencing that is to be used to fence off the other three sides. What should be the dimensions of the lot if the enclosed area is to be a maximum? What is the maximum area?
24. A rocket is fired upward from some initial distance above the ground. Its height in feet, h , above the ground, t seconds after it is fired, is given by
- $$h = -16t^2 + 64t + 4560$$
- What is the maximum height (in ft) of the rocket? How long does it take for the rocket to reach its maximum height? After it is fired, how long will it take for the rocket to reach the ground?