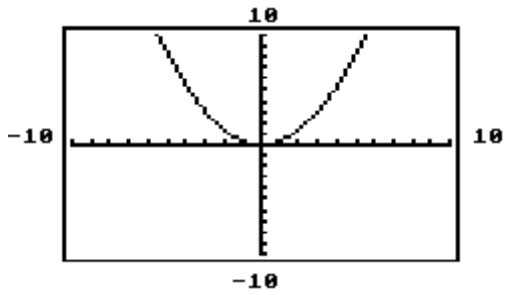


MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Which equation matches the given calculator-generated graph and description? Decide without using your calculator.

1)

1) _____



Parabola; opens upward

A) $-3x = y^2$

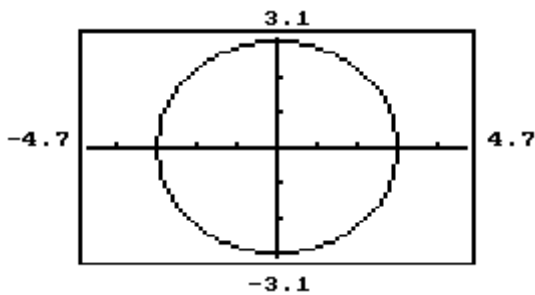
B) $-3y = x^2$

C) $3y = x^2$

D) $3x = y^2$

2)

2) _____



Circle; center (0, 0); radius 3

A) $x^2 + y^2 = 3$

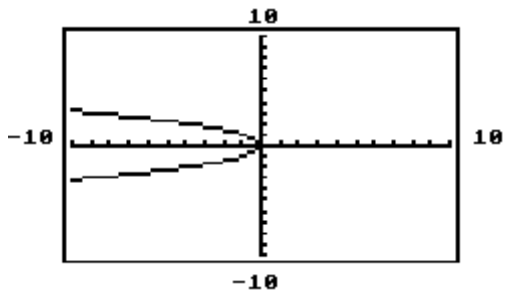
B) $x^2 + y^2 = 9$

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

D) $x^2 + y^2 = -9$

3)

3) _____



Parabola; opens left

A) $y = x^2$

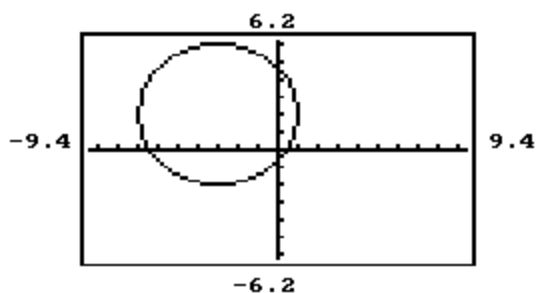
B) $x = -y^2$

C) $y = -x^2$

D) $x = y^2$

4)

4) _____



Circle; center $(-3, 2)$; radius 4

A) $(x+3)^2 + (y-2)^2 = 16$

B) $(x+2)^2 + (y-3)^2 = 16$

C) $(x-3)^2 + (y+2)^2 = 16$

D) $(x-2)^2 + (y+3)^2 = 16$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Find the center-radius form of the equation of the circle satisfying the given conditions.

5) Center $(2, 0)$, radius 1

5) _____

6) Center $\left(-\frac{4}{3}, -\frac{9}{10}\right)$, radius $\frac{5}{6}$

6) _____

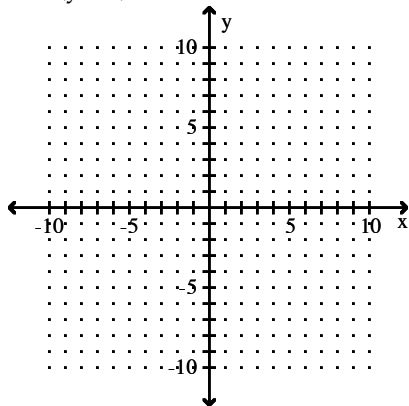
7) Center $(25, 24)$, tangent to the y -axis

7) _____

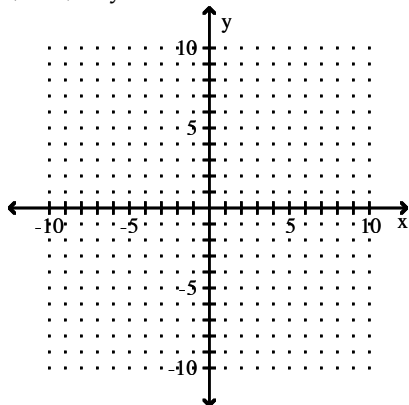
Graph the circle if possible.

8) $x^2 + (y-4)^2 = 25$

8) _____



9) $(x+2)^2 + y^2 = 4$



9) _____

Find the center and radius of the circle.

10) $x^2 + y^2 = -8x + 48$

10) _____

11) $9x^2 - 9x + 9y^2 + 9y - 2 = 0$

11) _____

Find the coordinates of the vertex and the direction of opening of each parabola.

12) $y = -(x+2)^2 + 9$

12) _____

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

13) _____

Give the focus, directrix, and axis for the parabola.

14) $-\frac{1}{36}x^2 = y$

14) _____

15) $x = 6y^2$

15) _____

Write an equation for the parabola with vertex at the origin.

16) Focus (0, 4)

16) _____

Find an equation for the parabola with vertex at the origin.

17) Through (-5, 5), opening to the left

17) _____

18) Through (3, -6), opening downward

18) _____

Find an equation of a parabola that satisfies the given conditions.

19) Vertex (8, -6), focus (11, -6)

19) _____

20) Vertex (3, -3), focus (3, 2)

20) _____

For the given parabola, give the coordinates of the vertex, the axis, the domain, and the range.

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

21) _____

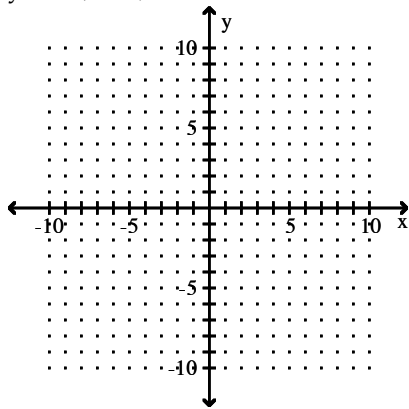
$$22) y = (x+3)^2 + 2$$

22) _____

Graph the parabola.

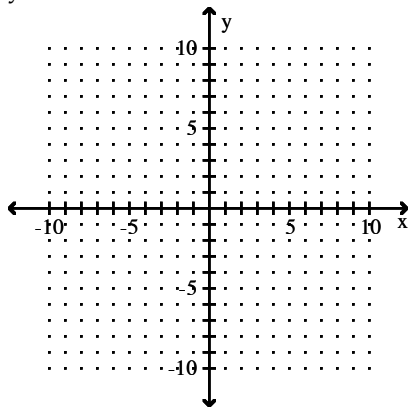
$$23) y = -4(x-8)^2 + 5$$

23) _____



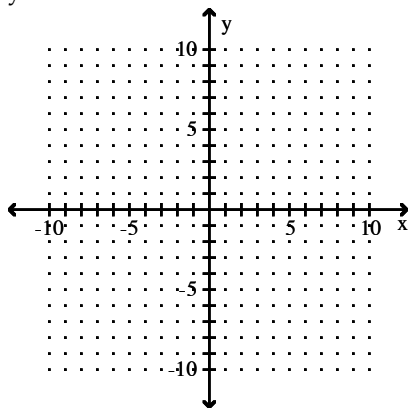
$$24) y = x^2 + 2x - 3$$

24) _____



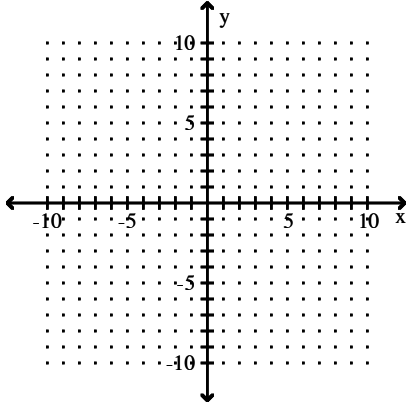
$$25) y = -2x^2 + 2x - 2$$

25) _____



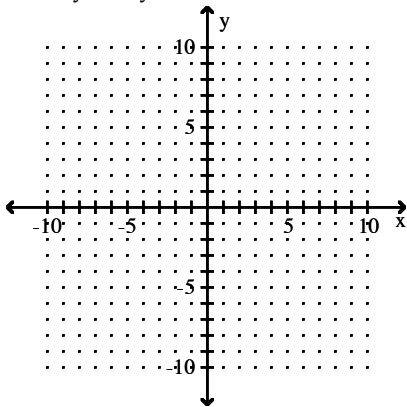
26) $x = y^2 - 4y - 2$

26) _____



27) $x = -2y^2 + 5y + 5$

27) _____

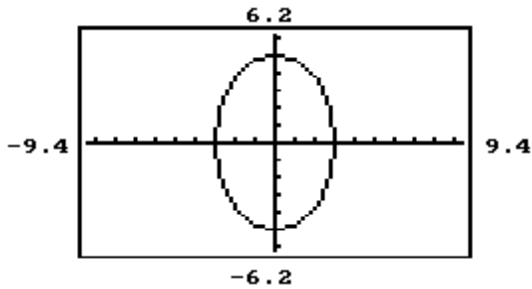


MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Which equation matches the given calculator-generated graph and description? Decide without using your calculator.

28)

28) _____



Ellipse; foci $(0, \pm 4)$

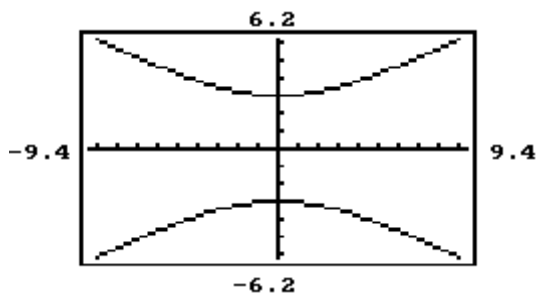
A) $\frac{x^2}{25} + \frac{y^2}{9} = 1$

B) $\frac{y^2}{25} - \frac{x^2}{9} = 1$

C) $\frac{y^2}{10} + \frac{x^2}{6} = 1$

D) $\frac{y^2}{25} + \frac{x^2}{9} = 1$

29)



Center (0, 0); vertical transverse axis

A) $\frac{x^2}{9} + \frac{y^2}{25} = 1$

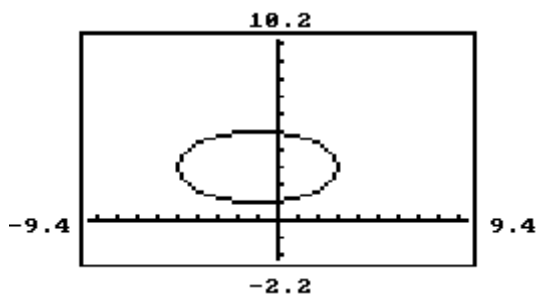
B) $\frac{y^2}{25} - \frac{x^2}{9} = 1$

C) $\frac{y^2}{9} - \frac{x^2}{25} = 1$

D) $\frac{y^2}{9} + \frac{x^2}{25} = 1$

29) _____

30)



Horizontal major axis; center (-1, 3)

A) $\frac{(x+1)^2}{4} + \frac{(y-3)^2}{16} = 1$

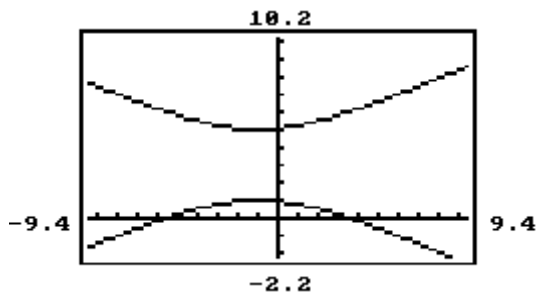
B) $\frac{(x-1)^2}{16} + \frac{(y+3)^2}{4} = 1$

C) $\frac{(x-1)^2}{4} + \frac{(y+3)^2}{16} = 1$

D) $\frac{(x+1)^2}{16} + \frac{(y-3)^2}{4} = 1$

30) _____

31)



Hyperbola; center (-1, 3)

A) $\frac{(y-3)^2}{4} - \frac{(x+1)^2}{16} = 1$

B) $\frac{(x-1)^2}{16} - \frac{(y-3)^2}{4} = 1$

C) $\frac{(y-3)^2}{16} - \frac{(x+1)^2}{4} = 1$

D) $\frac{(x-3)^2}{16} - \frac{(x+1)^2}{4} = 1$

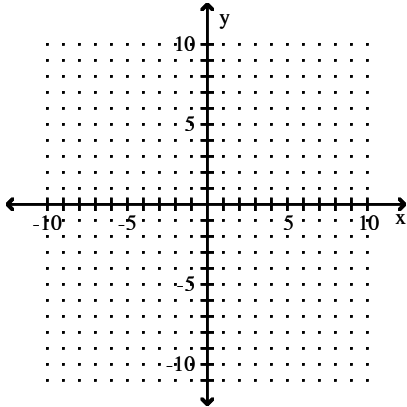
31) _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Graph the ellipse.

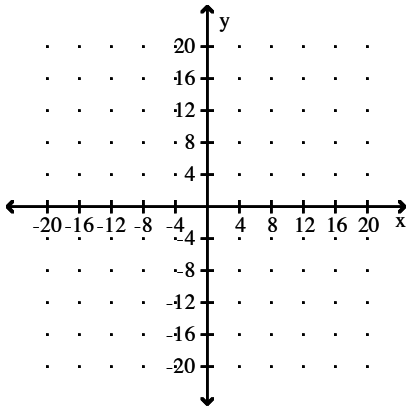
32) $4(x+3)^2 + 25(y-2)^2 = 100$

32) _____



33) $\frac{(x-3)^2}{25} + \frac{(y+2)^2}{9} = 1$

33) _____



Find an equation of the ellipse.

34) An ellipse with center at origin, length of major axis 14 and y-intercepts ± 5

34) _____

35) An ellipse with endpoints of major axis at $(0, 9)$, $(0, -9)$; $c = 5$

35) _____

36) An ellipse with foci at $(-2, -4)$ and $(4, -4)$; major axis length of 10

36) _____

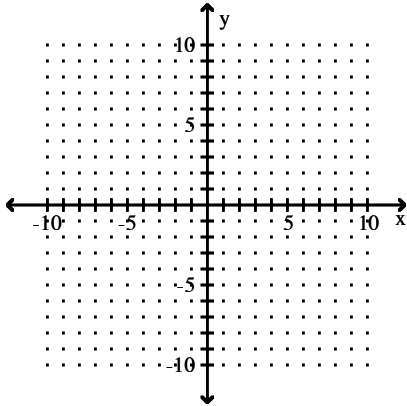
37) An ellipse with center at $(5, 2)$, $a = 7$, $b = 4$, and major axis vertical

37) _____

Graph the hyperbola.

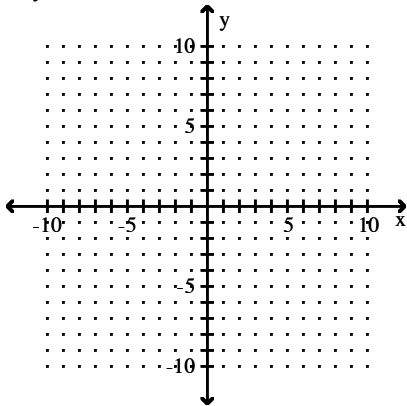
38) $\frac{x^2}{16} - \frac{y^2}{64} = 1$

38) _____



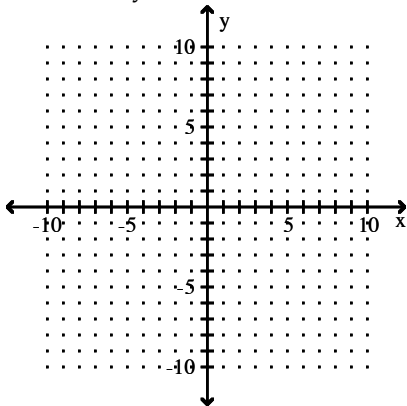
39) $36y^2 - 16x^2 = 576$

39) _____



40) $9(x-2)^2 - (y+5)^2 = 1$

40) _____



Find an equation of the hyperbola.

41) Vertices at (0, 7), (0, -7); foci at (0, 8), (0, -8)

41) _____

42) Foci at (5, 0), (-5, 0); transverse axis with length 6

42) _____

Write the equation in standard form for an ellipse or a hyperbola centered at (h, k).

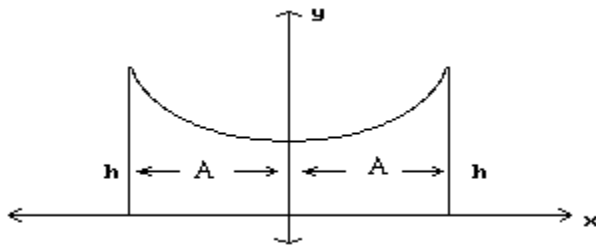
43) $6x^2 - 5y^2 - 12x + 30y - 69 = 0$ 43) _____

44) $12x^2 - 84x + 16y^2 + 32y + 151 = 0$ 44) _____

Solve.

45) The roof of a building is in the shape of the hyperbola $y^2 - 7x^2 = 35$, where x and y are in meters. Refer to the figure and determine the height, h, of the outside walls. 45) _____

$A = 9$ m



Provide the proper response.

46) If an ellipse has vertices at $(-4, 0)$, $(4, 0)$, $(0, 2)$, and $(0, -2)$, what is its domain? What is its range? 46) _____

47) In the ellipse $\frac{(y+7)^2}{36} + \frac{(x-4)^2}{16} = 1$, what is the equation of the horizontal axis of symmetry? The vertical axis of symmetry? 47) _____

Identify the equation as a parabola, circle, ellipse, or hyperbola.

48) $x^2 + y^2 = 16$ 48) _____

49) $x^2 - y^2 = 25$ 49) _____

50) $4x = 2y^2 - 31$ 50) _____

51) $(x-5)^2 = 9 - y^2$ 51) _____

Identify the type of graph.

52) $\frac{x^2}{10} = 1 - \frac{y^2}{1}$ 52) _____

53) $\frac{x^2}{64} + \frac{y^2}{64} = 1$ 53) _____

54) $2x^2 + 28x + 2y^2 - 36y = -259$

54) _____

55) $x^2 - 11x + y = 0$

55) _____

56) $-2x^2 + 16x + 4y^2 - 64y - 32 = -256$

56) _____

Find the eccentricity of the ellipse or hyperbola.

57) $8x^2 - 9y^2 = 72$

57) _____

58) $x^2 + 4y^2 = 36$

58) _____

59) $x^2 - 16y^2 = 1$

59) _____

Find an equation for the conic. If the conic is a parabola, assume that the vertex is at the origin. If the conic is an ellipse or hyperbola, assume that it is centered at the origin.

60) Focus at (2, 0) and $e = \frac{1}{2}$

60) _____

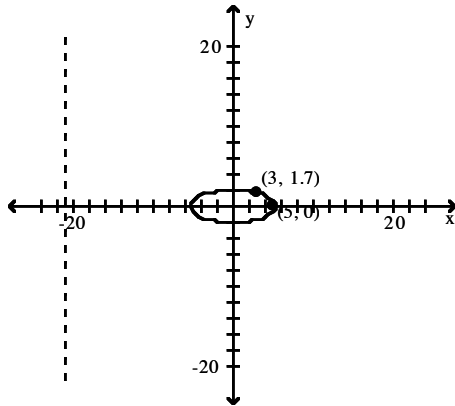
61) Focus at (6, 0) and $e = \frac{3}{2}$

61) _____

Find the eccentricity of the conic section shown in the graph.

62) $x = -21$

62) _____



Solve the problem.

63) Suppose that the orbit of a particular planet around the sun is an ellipse with equation $\frac{x^2}{6724} + \frac{y^2}{6561} = 1$, where x and y are measured in millions of miles. Find the eccentricity of this ellipse. (Round to the nearest thousandth.)

63) _____

Provide an appropriate response.

64) Suppose that $AC < 0$ in the equation $Ax^2 + Bx + Cy^2 + Dy + E = 0$. What kind of graph does this equation have?

64) _____

65) True or False? A parabola has eccentricity 1.

65) _____

66) True or False? An ellipse has eccentricity between 0 and 1.

66) _____

67) True or False? A hyperbola has eccentricity greater than 1.

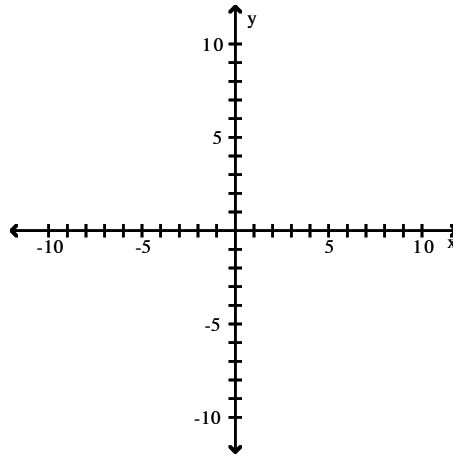
67) _____

Graph the pair of parametric equations by hand, using values of t in $[-2,2]$. Make a table of t -, x -, and y -values, using $t = -2, -1, 0, 1,$ and 2 . Then plot the points and join them with a line or smooth curve for all values of t in $[-2,2]$. Do not use a calculator.

68) $x = -t - 2, y = 2t - 1$

68) _____

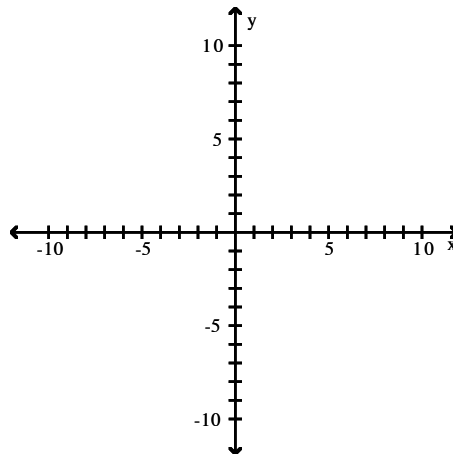
t	x	y
-2		
-1		
0		
1		
2		



69) $x = t^2 - 1, y = -t + 2$

69) _____

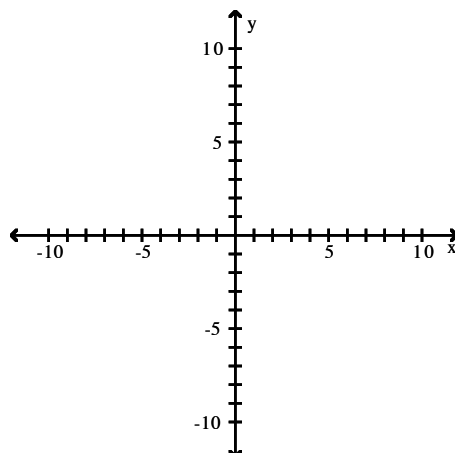
t	x	y
-2		
-1		
0		
1		
2		



70) $x = -t^2 - 3, y = t + 2$

70) _____

t	x	y
-2		
-1		
0		
1		
2		



Find a rectangular equation for the plane curve defined by the parametric equations.

71) $x = \sqrt{t}, y = 2t + 5$, for t in $(0, \infty)$

71) _____

72) $x = t - 3, y = t^2 + 5$, for t in $(-\infty, \infty)$

72) _____

73) $x = 5t^3, y = 7t^2$, for t in $(-\infty, \infty)$

73) _____

Give two parametric representations for the plane curve.

74) $y = \sqrt{3x+7}, x$ in $\left[-\frac{7}{3}, \infty\right)$

74) _____

Solve.

75) The motion of a projectile that is fired at a 45° angle with the horizontal is given by $x = v_0 \frac{\sqrt{2}}{2} t, y = v_0 \frac{\sqrt{2}}{2} t - 16t^2$, for t in $[0, k]$. Suppose a projectile is fired with an initial

75) _____

velocity of 100 feet per second at an angle of 45° with the horizontal. Find (a) the time when it reaches maximum altitude (b) the maximum altitude.

76) The motion of a projectile that is fired at a 30° angle with the horizontal is given by $x = v_0 \frac{\sqrt{3}}{2} t, y = \frac{v_0}{2} t - 16t^2$, for t in $[0, \infty)$. Suppose a projectile is fired with an initial velocity

76) _____

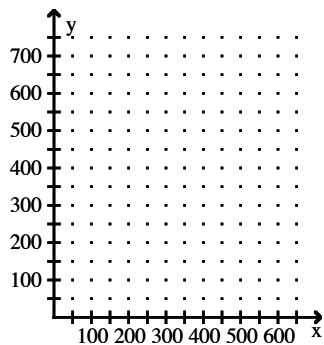
of 300 feet per second at an angle of 30° with the horizontal. Find (a) the time when it strikes the ground and (b) the range (horizontal distance covered).

77) The motion of a projectile that is fired at a 60° angle with the horizontal is given by $x = \frac{v_0}{2} t, y = v_0 \frac{\sqrt{3}}{2} t - 16t^2$, for t in $[0, \infty)$. Suppose a projectile is fired with an initial velocity

77) _____

of 550 feet per second at an angle of 60° with the horizontal. Find (a) the time when it reaches maximum altitude (b) the maximum altitude.

- 78) A projectile moves so that its position at any time t is given by the equations $x = 24t$ and $y = 176t - 16t^2$ for t in $[0, 11]$. Graph the path of the projectile and find the equivalent rectangular equation. Use the window $[0, 700]$ by $[0, 800]$. 78) _____



Provide an appropriate response.

- 79) True or false? The parametric equations $x = t^2$, $y = 3t - 2$ will graph a parabola. 79) _____

- 80) True or false? The parametric equations $x = t^2$, $y = 3t - 2$ will graph a line. 80) _____