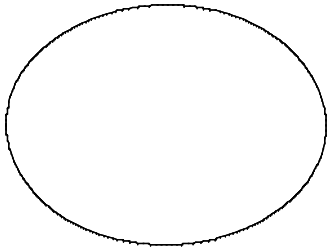
HW7 Date: _____ Name_____

Use Scantron 882E to transfer the answers. Be sure you keep your scantron CLEAN and FLAT before its submission.
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

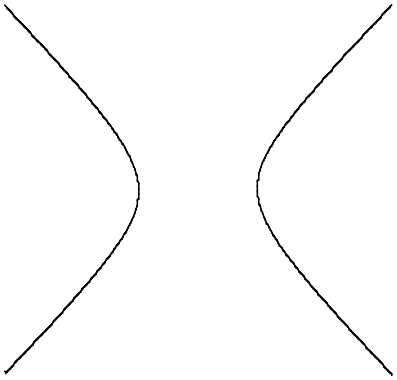
Name the conic.

1) 1) _____



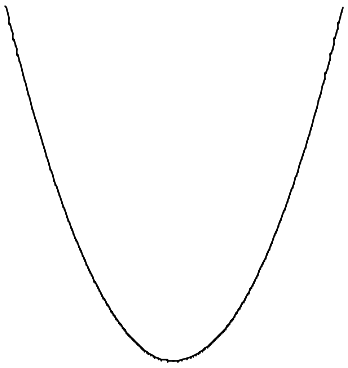
A) ellipse B) parabola C) hyperbola D) circle

2) 2) _____



A) hyperbola B) ellipse C) circle D) parabola

3) 3) _____

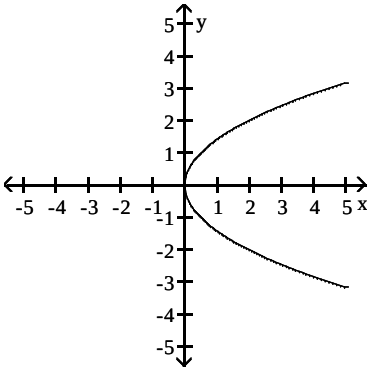


A) parabola B) ellipse C) circle D) hyperbola

Match the equation to its graph.

4) $y^2 = 2x$ 4) _____

A)



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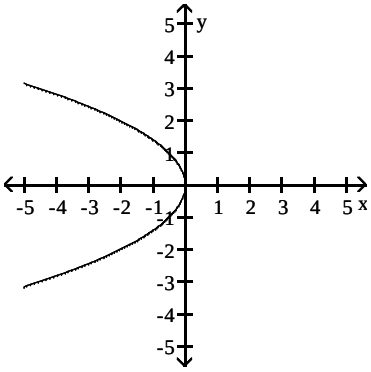

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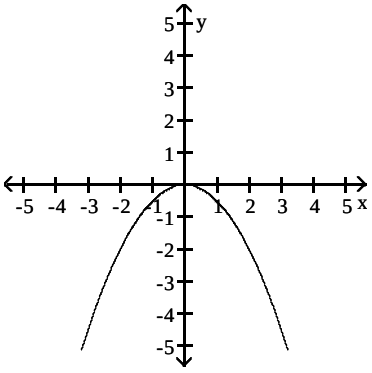

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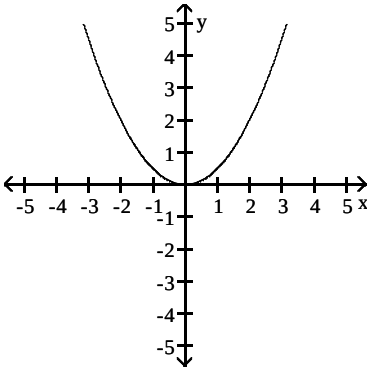
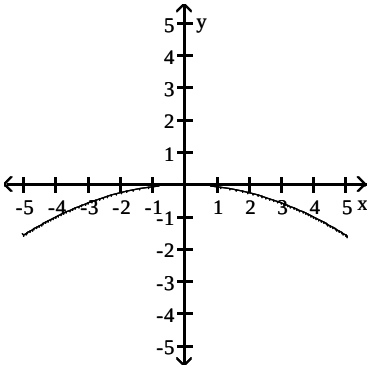


5) $x^2 = 16y$ 5) _____

A)



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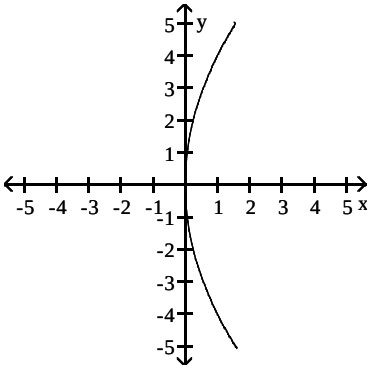

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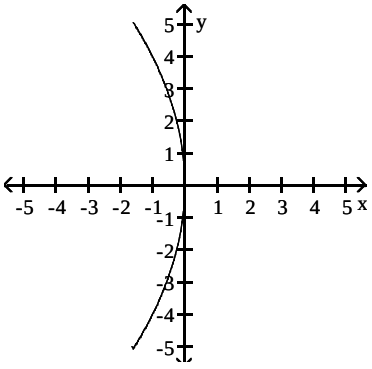
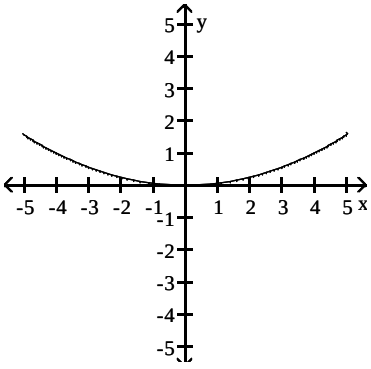
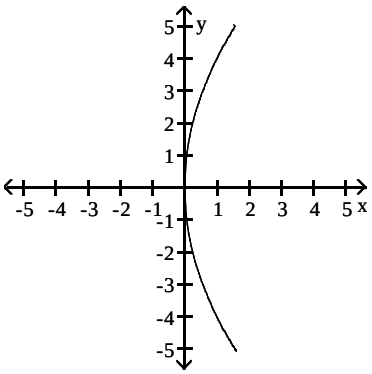


D)



6) $y^2 = 16x$ 6) _____

A)



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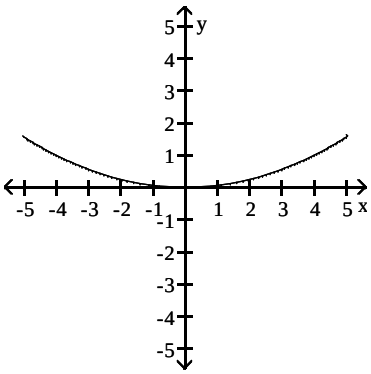

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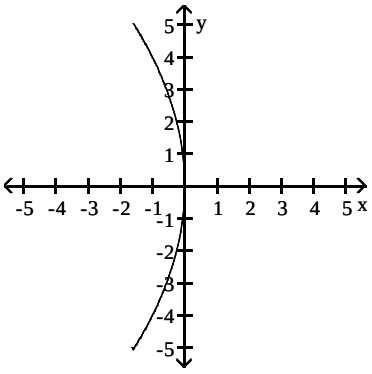

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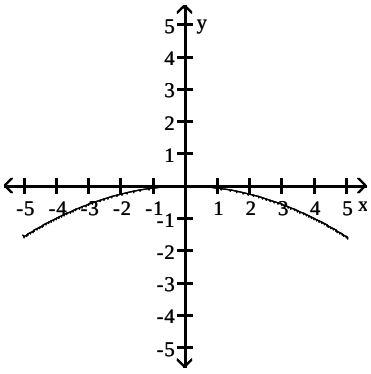
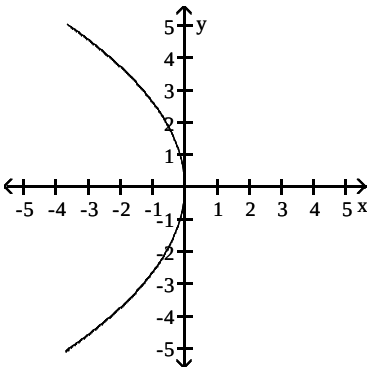


7) $x^2 = -7y$ 7) _____

A)



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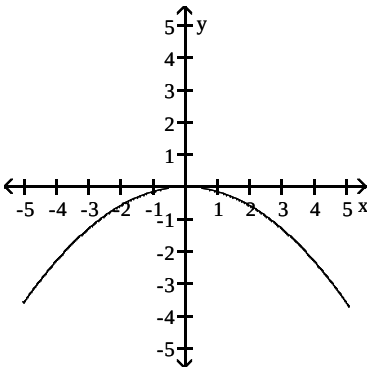

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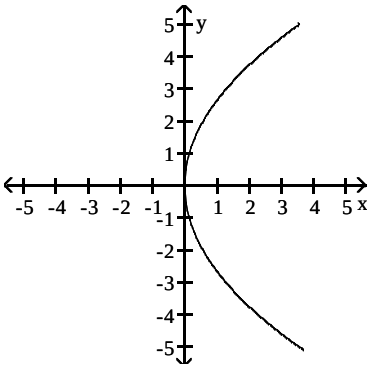
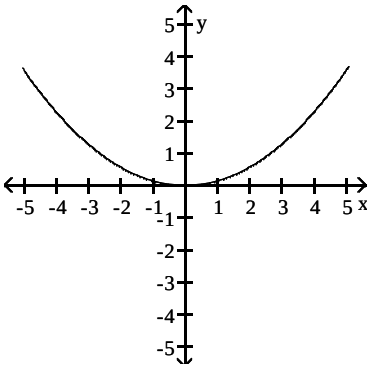


D)



Find an equation of the parabola described.

8) Focus at (–16, 0); directrix the line x = 16 8) _____

A) $y^2 = -16x$ B) $y^2 = 64x$ C) $x^2 = -64y$ D) $y^2 = -64x$

9) Focus at (0, –5); directrix the line y = 5 9) _____

A) $y^2 = -5x$ B) $y^2 = -20x$ C) $x^2 = 20y$ D) $x^2 = -20y$

10) Focus at (3, 0); vertex at (0, 0) 10) _____

A) $y^2 = 12x$ B) $x^2 = 3y$ C) $y^2 = 3x$ D) $x^2 = 12y$

11) Directrix the line y = 3; vertex at (0, 0) 11) _____

A) $x = -\frac{1}{12}y^2$ B) $y = -\frac{1}{12}x^2$ C) $x = 3y^2$ D) $y = -12x^2$

12) Focus at (5, 0); vertex at (0, 0) 12) _____

A) $y = 20x^2$ B) $x^2 = 20y$ C) $y^2 = 20x$ D) $x = 20y^2$

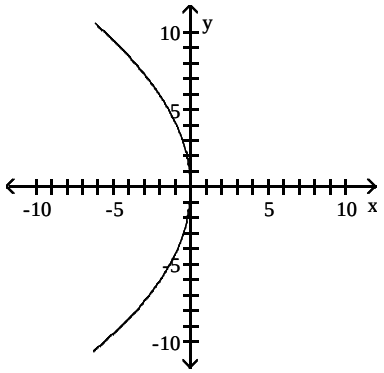
13) Vertex at (0, 0); axis of symmetry the x–axis; containing the point (3, 4) 13) _____

A) $y^2 = \frac{16}{3}x$ B) $x^2 = \frac{4}{3}y$ C) $x^2 = \frac{16}{3}y$ D) $y^2 = \frac{4}{3}x$

Graph the equation.

14) $y^2 = -18x$ 14) _____

A)



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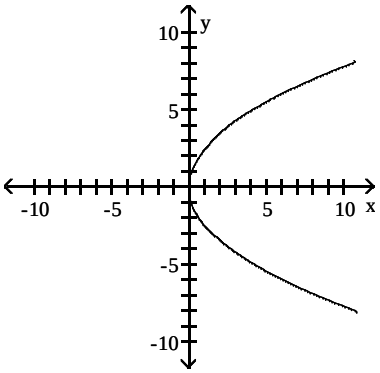

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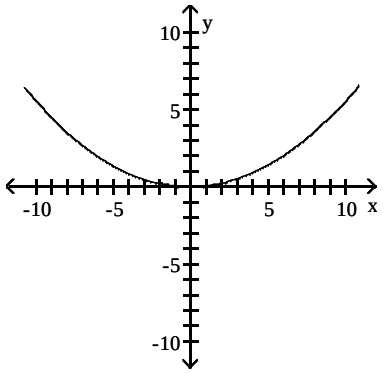
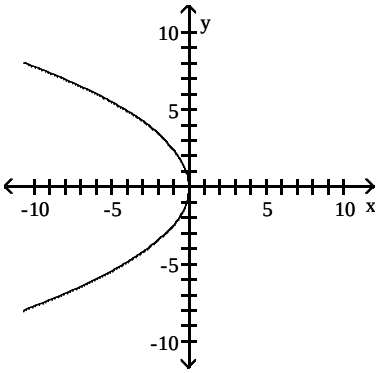


D)



Find an equation of the parabola described and state the two points that define the latus rectum.

15) Focus at (0, 4); directrix the line y = –4 15) _____

A) $y^2 = 4x$; latus rectum: (9, 2) and (–9, 2)

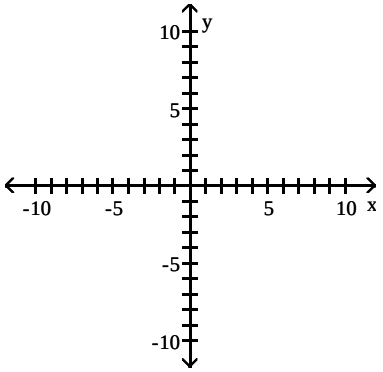
B) $x^2 = 16y$; latus rectum: (4, 8) and (–4, 8)

C) $x^2 = 16y$; latus rectum: (8, 4) and (–8, 4)

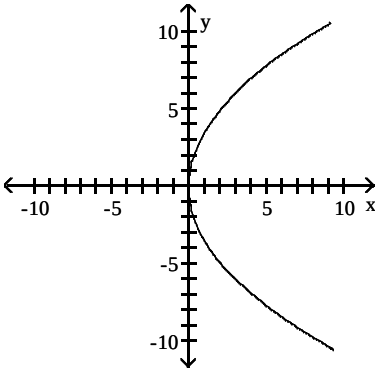
D) $x^2 = 4y$; latus rectum: (2, 4) and (–2, 4)

Graph the equation.

16) $x^2 = -12y$ 16) _____



A)



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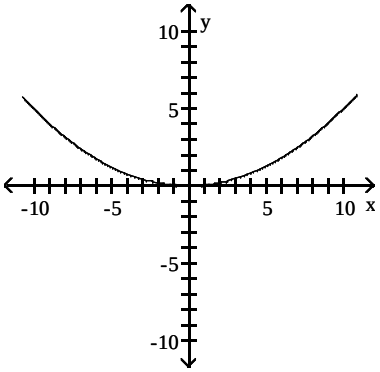
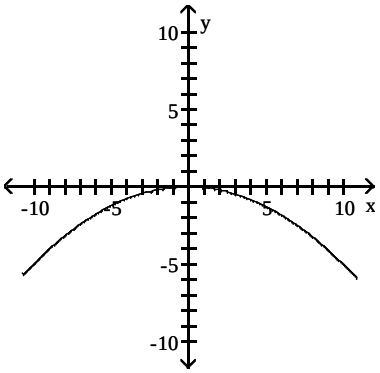
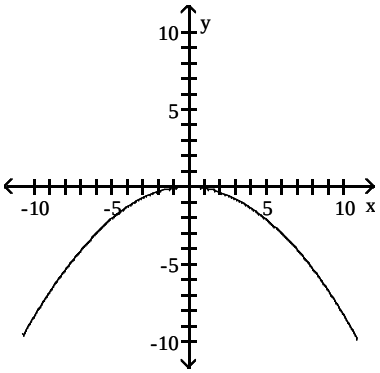


C)

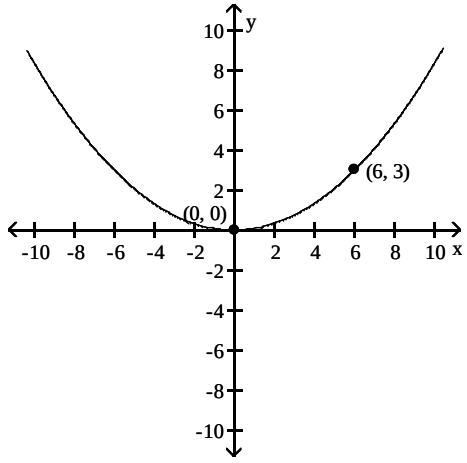


D)



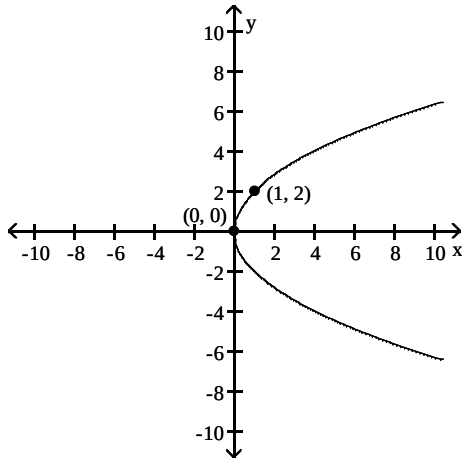
Write an equation for the parabola.

17) 17) _____



A) $x^2 = 12y$ B) $y^2 = 12x$ C) $y^2 = -12x$ D) $x^2 = -12y$

18) 18) _____



A) $y^2 = -4x$ B) $x^2 = -4y$ C) $x^2 = 4y$ D) $y^2 = 4x$

Find an equation for the parabola described.

19) Vertex at (7, 9); focus at (3, 9) 19) _____

A) $(x - 9)^2 = -24(y - 9)$ B) $(x - 9)^2 = 24(y - 9)$

C) $(y - 9)^2 = -16(x - 7)$ D) $(y - 9)^2 = 16(x - 7)$

20) Vertex at (4, 1); focus at (4, 2) 20) _____

A) $(x - 4)^2 = -4(y - 1)$ B) $(y - 1)^2 = -8(x - 4)$

C) $(x - 4)^2 = 4(y - 1)$ D) $(y - 1)^2 = 8(x - 4)$

21) Vertex at (6, –2); focus at (6, –4) 21) _____

A) $(x - 6)^2 = -8(y + 2)$ B) $(x - 6)^2 = 8(y + 2)$

C) $(y - 2)^2 = 8(x + 6)$ D) $(y - 2)^2 = -8(x + 6)$

Find the vertex, focus, and directrix of the parabola with the given equation.

22) $(y + 1)^2 = 16(x - 3)$ 22) _____

A) vertex: (3, –1)
focus: (7, –1)
directrix: x = –1

B) vertex: (–3, 1)
focus: (1, 1)
directrix: x = –7

C) vertex: (3, –1)
focus: (–1, –1)
directrix: x = 7

D) vertex: (–1, 3)
focus: (3, 3)
directrix: x = –5

23) $(x - 1)^2 = 4(y - 3)$ 23) _____

A) vertex: (1, 3)
focus: (1, 4)
directrix: y = 2

B) vertex: (3, 1)
focus: (3, 2)
directrix: y = 0

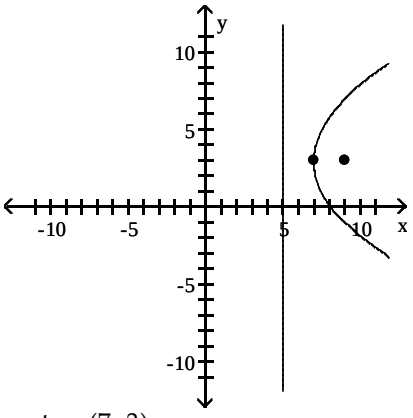
C) vertex: (1, 3)
focus: (1, 2)
directrix: x = 4

D) vertex: (–1, –3)
focus: (–1, –2)
directrix: y = –4

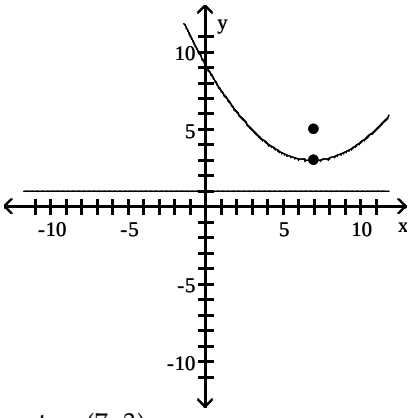
Find the vertex, focus, and directrix of the parabola. Graph the equation.

24) $x^2 - 14x = 8y - 73$ 24) _____

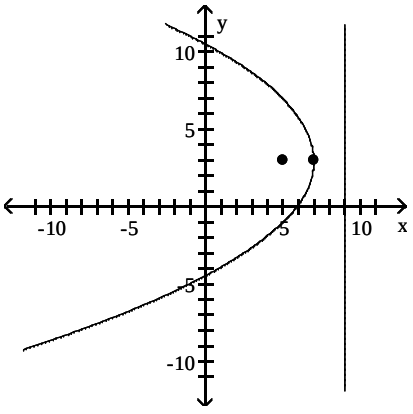
A) vertex: (7, 3)
focus: (9, 3)
directrix: x = 5



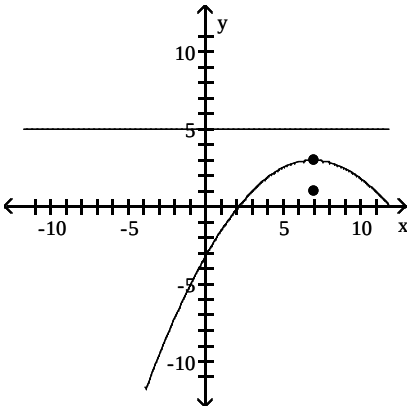
B) vertex: (7, 3)
focus: (7, 5)
directrix: y = 1



C) vertex: (7, 3)
focus: (5, 3)
directrix: x = 9



D) vertex: (7, 3)
focus: (7, 1)
directrix: y = 5



Solve the problem.

25) A reflecting telescope contains a mirror shaped like a paraboloid of revolution. If the mirror is 20 inches across at its opening and is 3 feet deep, where will the light be concentrated? 25) _____

A) 0.7 in. from the vertex B) 0.2 in. from the vertex
C) 8.3 in. from the vertex D) 0.5 in. from the vertex

26) A searchlight is shaped like a paraboloid of revolution. If the light source is located 2 feet from the base along the axis of symmetry and the opening is 8 feet across, how deep should the searchlight be? 26) _____

A) 2 ft B) 8 ft C) 0.3 ft D) 4 ft

27) A bridge is built in the shape of a parabolic arch. The bridge arch has a span of 192 feet and a maximum height of 30 feet. Find the height of the arch at 25 feet from its center. 27) _____

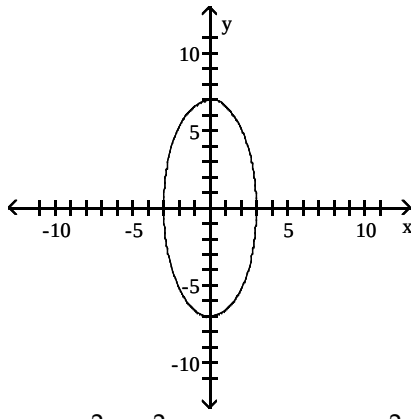
A) 66.7 ft B) 0.5 ft C) 28 ft D) 8.1 ft

28) An experimental model for a suspension bridge is built in the shape of a parabolic arch. In one section, cable runs from the top of one tower down to the roadway, just touching it there, and up again to the top of a second tower. The towers are both 9 inches tall and stand 60 inches apart. Find the vertical distance from the roadway to the cable at a point on the road 15 inches from the lowest point of the cable. 28) _____

A) 2.05 in. B) 9 in. C) 2.25 in. D) 2.45 in.

Match the graph to its equation.

29) 29) _____



A) $\frac{x^2}{9} - \frac{y^2}{49} = 1$ B) $\frac{y^2}{49} + \frac{x^2}{9} = 1$ C) $\frac{x^2}{49} + \frac{y^2}{9} = 1$ D) $\frac{y^2}{49} - \frac{x^2}{9} = 1$

Find an equation for the ellipse described.

30) Foci at (0, ±5); y–intercepts are ±6 30) _____

A) $\frac{x^2}{11} + \frac{y^2}{36} = 1$ B) $\frac{x^2}{25} + \frac{y^2}{11} = 1$ C) $\frac{x^2}{25} + \frac{y^2}{36} = 1$ D) $\frac{x^2}{36} + \frac{y^2}{11} = 1$

31) Center (0, 0); major axis horizontal with length 8; length of minor axis is 6 31) _____

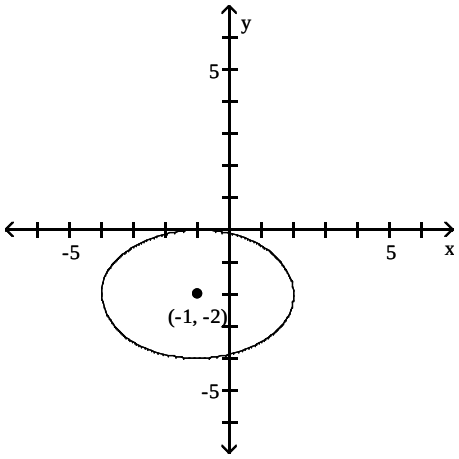
A) $\frac{x^2}{16} + \frac{y^2}{9} = 1$ B) $\frac{x^2}{8} + \frac{y^2}{9} = 1$ C) $\frac{x^2}{9} + \frac{y^2}{16} = 1$ D) $\frac{x^2}{64} + \frac{y^2}{36} = 1$

32) Center (0, 0); major axis vertical with length 10; length of minor axis is 6 32) _____

A) $\frac{x^2}{9} + \frac{y^2}{25} = 1$ B) $\frac{x^2}{36} + \frac{y^2}{100} = 1$ C) $\frac{x^2}{6} + \frac{y^2}{25} = 1$ D) $\frac{x^2}{25} + \frac{y^2}{9} = 1$

Write an equation for the graph.

33) 33) _____



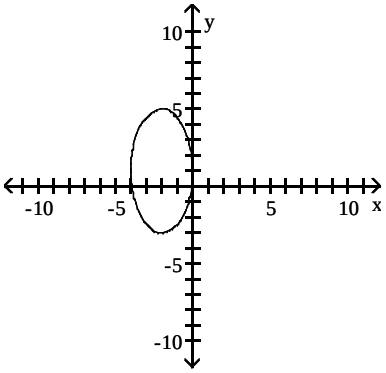
A) $\frac{(x + 1)^2}{4} + \frac{(y + 2)^2}{9} = 1$ B) $\frac{(x + 2)^2}{9} + \frac{(y + 1)^2}{4} = 1$

C) $\frac{(x + 1)^2}{9} + \frac{(y + 2)^2}{4} = 1$ D) $\frac{(x - 1)^2}{9} + \frac{(y - 2)^2}{4} = 1$

Graph the equation.

34) $4(x - 1)^2 + 16(y + 2)^2 = 64$ 34) _____

A)



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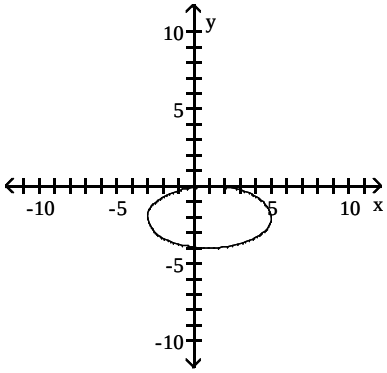

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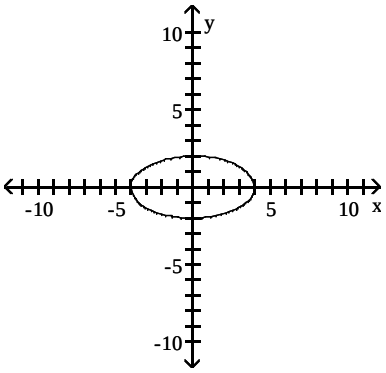
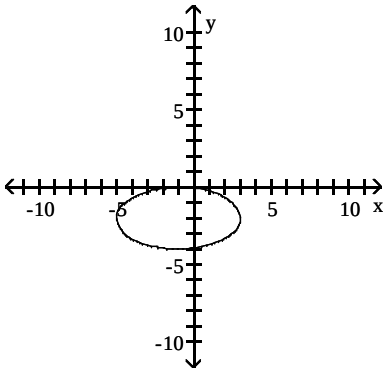


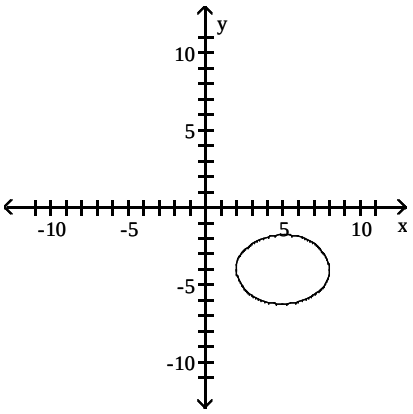
D)



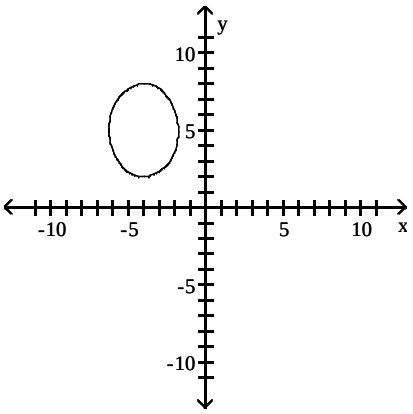
Find an equation for the ellipse described. Graph the equation.

35) Foci at (–2, 5) and (–6, 5); vertex at (–7, 5) 35) _____

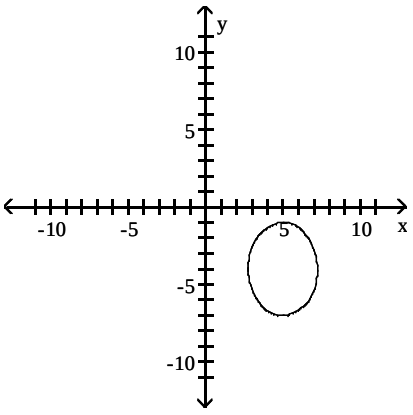
A) $\frac{(x-5)^2}{9}+\frac{(y+4)^2}{5}=1$



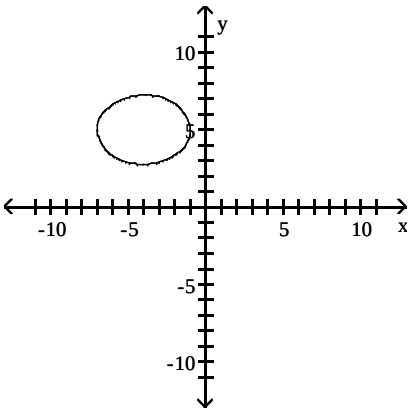
B) $\frac{(x+4)^2}{5}+\frac{(y-5)^2}{9}=1$



C) $\frac{(x-5)^2}{5}+\frac{(y+4)^2}{9}=1$



D) $\frac{(x+4)^2}{9}+\frac{(y-5)^2}{5}=1$



Find the center, foci, and vertices of the ellipse.

36) $\frac{(x-1)^2}{16}+\frac{(y+2)^2}{9}=1$ 36) _____

A) center at (1, –2)
foci at $(-\sqrt{7}, -2)$, $(\sqrt{7}, -2)$
vertices at (4, –2), (–4, –2)

B) center at (1, –2)
foci at $(1+\sqrt{7}, -2)$, $(1-\sqrt{7}, -2)$
vertices at (–3, –2), (5, –2)

C) center at (1, –2)
foci at $(1+\sqrt{7}, 1)$, $(1-\sqrt{7}, 1)$
vertices at (4, –2), (–4, –2)

D) center at (–2, 1)
foci at $(-2+\sqrt{7}, 1)$, $(-2-\sqrt{7}, 1)$
vertices at (–3, –2), (5, –2)

37) $36(x+1)^2+25(y-1)^2=900$ 37) _____

A) center at (–1, 1)
foci at $(-1, 1-\sqrt{11})$, $(-1, 1+\sqrt{11})$
vertices at (–1, 7), (–1, –5)

B) center at (1, –1)
foci at $(1, -1-\sqrt{11})$, $(1, -1+\sqrt{11})$
vertices at (1, 7), (1, –5)

C) center at (0, 1)
foci at $(0, 1-\sqrt{11})$, $(0, 1+\sqrt{11})$
vertices at (0, 7), (0, –5)

D) center at (1, 1)
foci at $(1, 1-\sqrt{11})$, $(1, 1+\sqrt{11})$
vertices at (1, 7), (1, –5)

Solve the problem.

38) A bridge is built in the shape of a semielliptical arch. It has a span of 96 feet. The height of the arch 27 feet from the center is to be 10 feet. Find the height of the arch at its center. 38) _____

A) 17.78 ft B) 27.61 ft C) 12.09 ft D) 10.42 ft

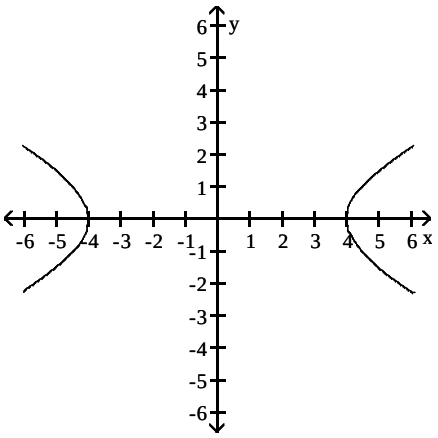
39) An arch for a bridge over a highway is in the form of a semiellipse. The top of the arch is 35 feet above ground (the major axis). What should the span of the bridge be (the length of its minor axis) if the height 28 feet from the center is to be 12 feet above ground? 39) _____

A) 59.61 ft B) 29.81 ft C) 40 ft D) 163.33 ft

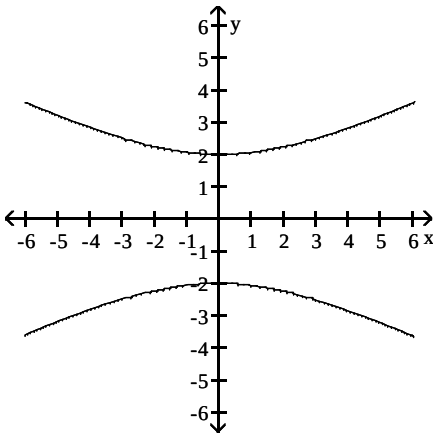
Match the equation to the graph.

40) $\frac{x^2}{4} - \frac{y^2}{16} = 1$ 40) _____

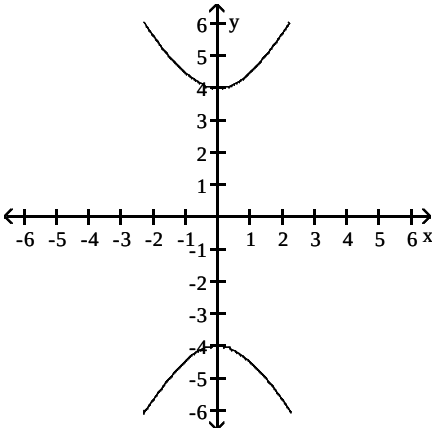
A)



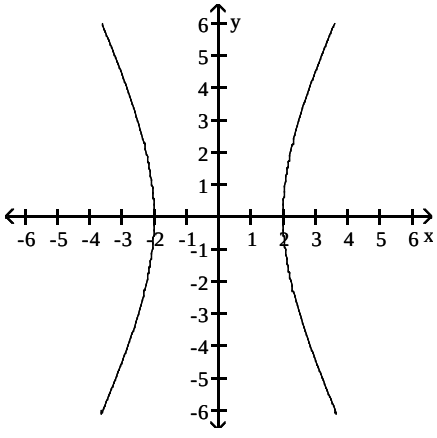
B)



C)

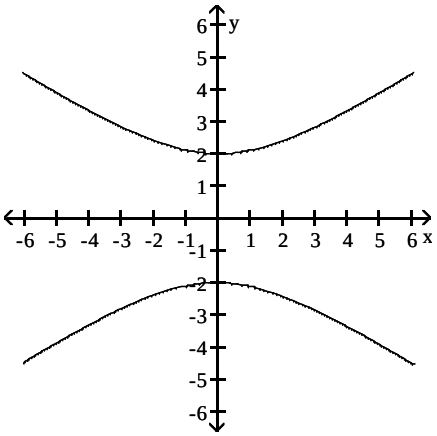


D)

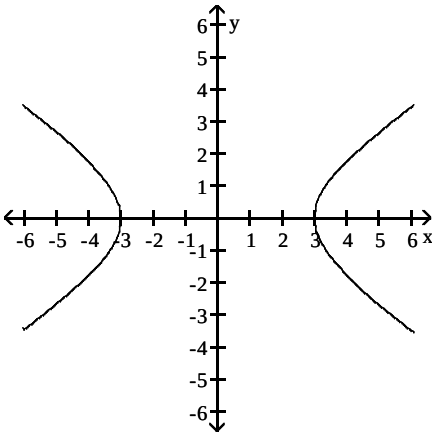


41) $\frac{y^2}{4} - \frac{x^2}{9} = 1$ 41) _____

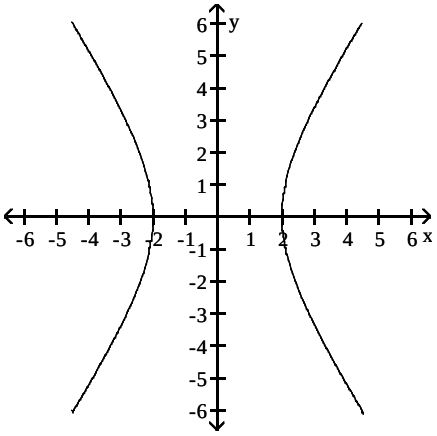
A)



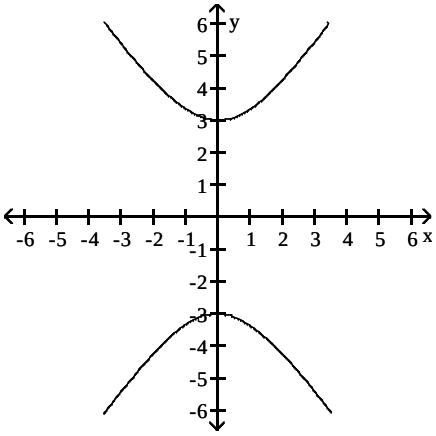
B)



C)

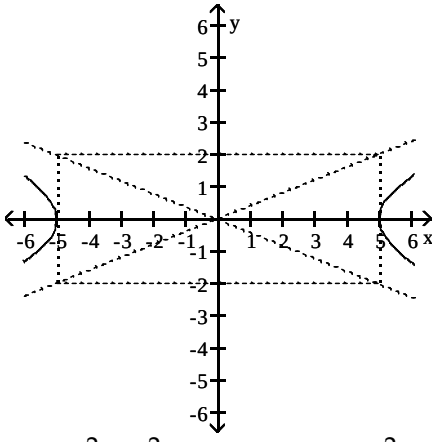


D)



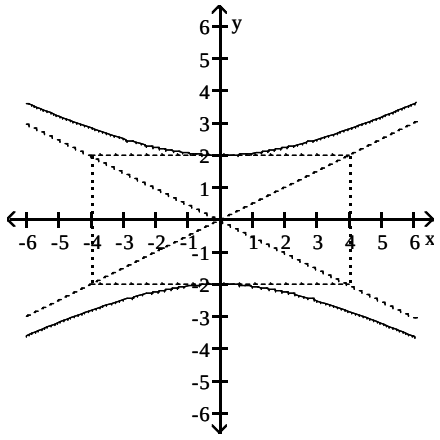
Write an equation for the hyperbola.

42) 42) _____



A) $\frac{x^2}{25} - \frac{y^2}{4} = 1$ B) $\frac{x^2}{4} - \frac{y^2}{25} = 1$ C) $\frac{y^2}{25} - \frac{x^2}{4} = 1$ D) $\frac{y^2}{4} - \frac{x^2}{25} = 1$

43) 43) _____

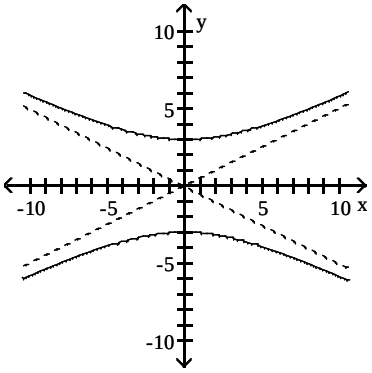


A) $\frac{y^2}{4} - \frac{x^2}{16} = 1$ B) $\frac{x^2}{16} - \frac{y^2}{4} = 1$ C) $\frac{y^2}{16} - \frac{x^2}{4} = 1$ D) $\frac{x^2}{4} - \frac{y^2}{16} = 1$

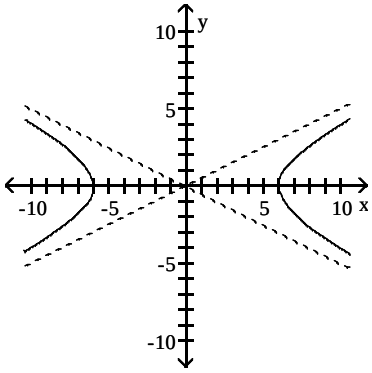
Graph the hyperbola.

44) $36x^2 - 9y^2 = 324$ 44) _____

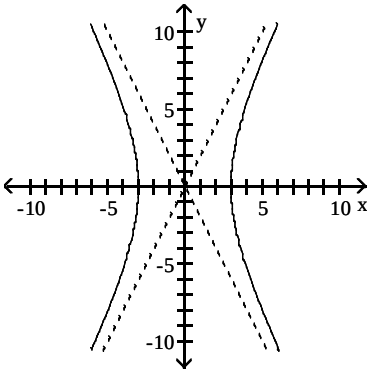
A)



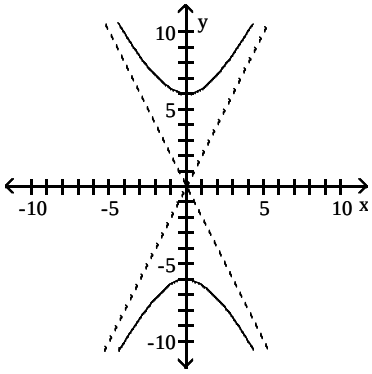
B)



C)

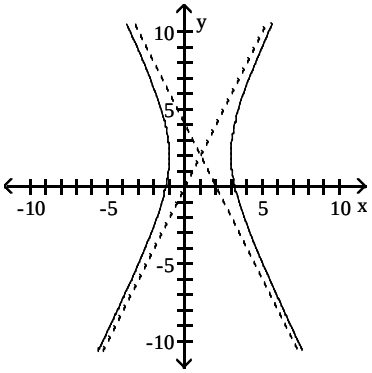


D)

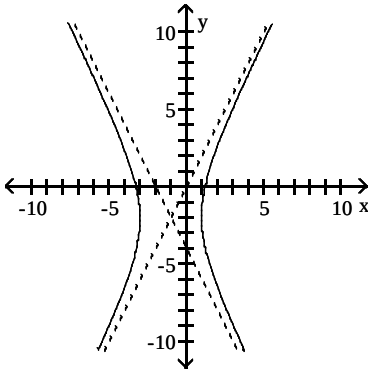


45) $\frac{(x+1)^2}{4} - \frac{(y-2)^2}{16} = 1$ 45) _____

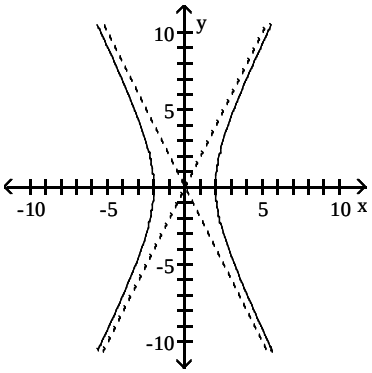
A)



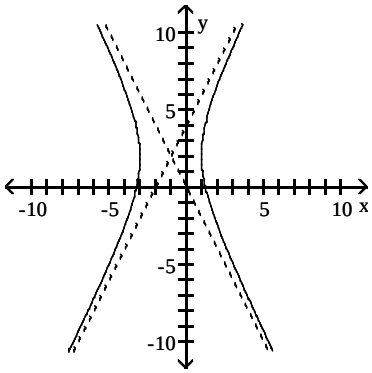
B)



C)

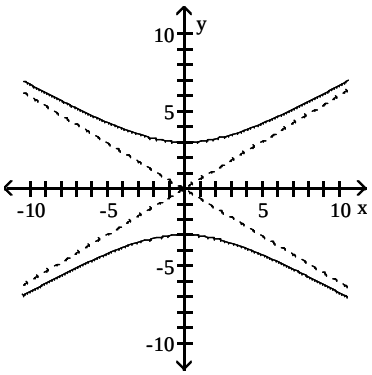


D)

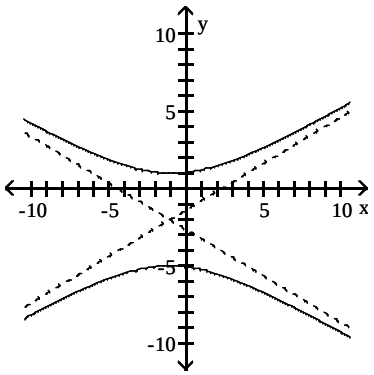


46) $\frac{(y+2)^2}{9} - \frac{(x-1)^2}{25} = 1$ 46) _____

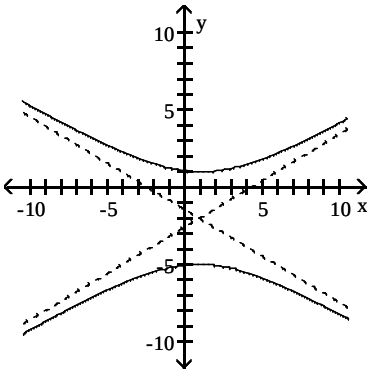
A)



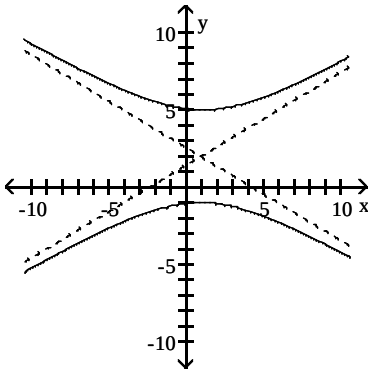
B)



C)



D)



Find an equation for the hyperbola described.

47) Vertices at (0, ±4); asymptotes at $y = \pm\frac{2}{9}x$ 47) _____

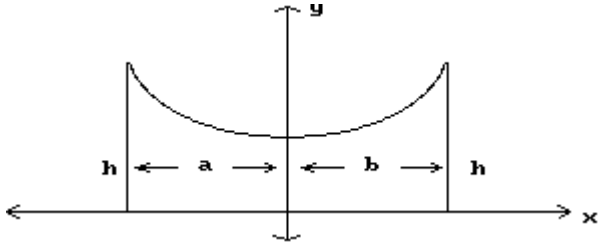
A) $\frac{y^2}{324} - \frac{x^2}{16} = 1$ B) $\frac{y^2}{16} - \frac{x^2}{81} = 1$ C) $\frac{y^2}{81} - \frac{x^2}{4} = 1$ D) $\frac{y^2}{16} - \frac{x^2}{324} = 1$

48) Vertices at (±2, 0); foci at (±8, 0) 48) _____

A) $\frac{x^2}{60} - \frac{y^2}{4} = 1$ B) $\frac{x^2}{4} - \frac{y^2}{60} = 1$ C) $\frac{x^2}{4} - \frac{y^2}{64} = 1$ D) $\frac{x^2}{64} - \frac{y^2}{4} = 1$

Solve the problem.

49) The roof of a building is in the shape of the hyperbola $y^2 - x^2 = 59$, where x and y are in meters. Refer to the figure and determine the height h of the outside walls. 49) _____



a = b = 6 m

A) 95 m B) –23 m C) 53 m D) 9.7 m