

## Chapter 2

1. Give a description of the indicated subset of the plane in terms of quadrants.

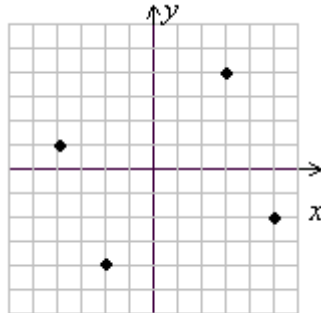
$$\{(x, y) \mid x < 0, y > 0\}$$

A) Quadrant I   B) Quadrant II   C) Quadrant III   D) Quadrant IV

Ans: B   Section: 2.1

2. Plot the points in a rectangular coordinate system.

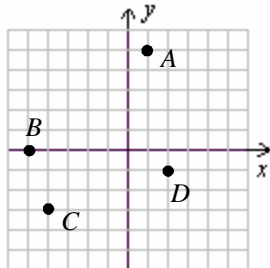
$$(5, -2), (-4, 1), (3, 4), (-2, -4)$$



Ans:

Section: 2.1

Use the following to answer questions 3-7:



3. Find the coordinates of points  $A$ ,  $B$ ,  $C$ , and  $D$ .

Ans:  $A = (1, 5)$ ,  $B = (-5, 0)$ ,  $C = (-4, -3)$ ,  $D = (2, -1)$

Section: 2.1

4. Reflect  $A$ ,  $B$ ,  $C$ , and  $D$  through the  $y$ -axis and give the coordinates of the reflected points,  $A'$ ,  $B'$ ,  $C'$ , and  $D'$ .

Ans:  $A' = (-1, 5)$ ,  $B' = (5, 0)$ ,  $C' = (4, -3)$ , and  $D' = (-2, -1)$

Section: 2.1

5. Reflect  $A$ ,  $B$ ,  $C$ , and  $D$  through the  $x$ -axis and give the coordinates of the reflected points,  $A'$ ,  $B'$ ,  $C'$ , and  $D'$ .

Ans:  $A' = (1, -5)$ ,  $B' = (-5, 0)$ ,  $C' = (-4, 3)$ , and  $D' = (2, 1)$

Section: 2.1

6. Reflect  $A$ ,  $B$ ,  $C$ , and  $D$  through the origin and give the coordinates of the reflected points,  $A'$ ,  $B'$ ,  $C'$ , and  $D'$ .

Ans:  $A' = (-1, -5)$ ,  $B' = (5, 0)$ ,  $C' = (4, 3)$ , and  $D' = (-2, 1)$

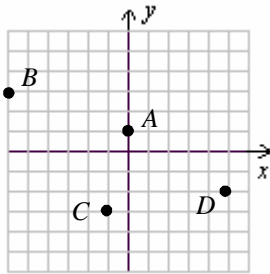
Section: 2.1

7. Reflect  $A$ ,  $B$ ,  $C$ , and  $D$  through the  $x$  axis and then through the  $y$ -axis and give the coordinates of the reflected points,  $A'$ ,  $B'$ ,  $C'$ , and  $D'$ .

Ans:  $A' = (-1, -5)$ ,  $B' = (5, 0)$ ,  $C' = (4, 3)$ , and  $D' = (-2, 1)$

Section: 2.1

Use the following to answer questions 8-12:



8. Find the coordinates of points  $A$ ,  $B$ ,  $C$ , and  $D$ .

A)  $A = (0, 1)$ ,  $B = (6, 3)$ ,  $C = (1, -3)$ ,  $D = (-5, -2)$

B)  $A = (1, 0)$ ,  $B = (3, 6)$ ,  $C = (-3, 1)$ ,  $D = (-2, -5)$

C)  $A = (0, 1)$ ,  $B = (-6, 3)$ ,  $C = (-1, -3)$ ,  $D = (5, -2)$

D)  $A = (1, 0)$ ,  $B = (3, -6)$ ,  $C = (-3, -1)$ ,  $D = (-2, 5)$

Ans: C Section: 2.1

9. Reflect  $A$ ,  $B$ ,  $C$ , and  $D$  through the  $y$ -axis and give the coordinates of the reflected points,  $A'$ ,  $B'$ ,  $C'$ , and  $D'$ .

A)  $A' = (-1, 0)$ ,  $B' = (-3, -6)$ ,  $C' = (3, -1)$ ,  $D' = (2, 5)$

B)  $A' = (0, 1)$ ,  $B' = (6, 3)$ ,  $C' = (1, -3)$ ,  $D' = (-5, -2)$

C)  $A' = (0, -1)$ ,  $B' = (-6, -3)$ ,  $C' = (-1, 3)$ ,  $D' = (5, 2)$

D)  $A' = (1, 0)$ ,  $B' = (3, -6)$ ,  $C' = (-3, 1)$ ,  $D' = (2, -5)$

Ans: B Section: 2.1

10. Reflect  $A$ ,  $B$ ,  $C$ , and  $D$  through the  $x$ -axis and give the coordinates of the reflected points,  $A'$ ,  $B'$ ,  $C'$ , and  $D'$ .

A)  $A' = (0, -1)$ ,  $B' = (-6, -3)$ ,  $C' = (-1, 3)$ ,  $D' = (5, 2)$

B)  $A' = (0, 1)$ ,  $B' = (6, 3)$ ,  $C' = (1, -3)$ ,  $D' = (-5, -2)$

C)  $A' = (-1, 0)$ ,  $B' = (-3, -6)$ ,  $C' = (3, -1)$ ,  $D' = (2, 5)$

D)  $A' = (1, 0)$ ,  $B' = (-3, 6)$ ,  $C' = (3, 1)$ ,  $D' = (2, -5)$

Ans: A Section: 2.1

11. Reflect  $A$ ,  $B$ ,  $C$ , and  $D$  through the origin and give the coordinates of the reflected points,  $A'$ ,  $B'$ ,  $C'$ , and  $D'$ .

- A)  $A' = (-1, 0)$ ,  $B' = (-3, 6)$ ,  $C' = (3, 1)$ ,  $D' = (2, -5)$
- B)  $A' = (0, -1)$ ,  $B' = (-6, -3)$ ,  $C' = (1, 3)$ ,  $D' = (5, 2)$
- C)  $A' = (1, 0)$ ,  $B' = (3, -6)$ ,  $C' = (-3, -1)$ ,  $D' = (-2, 5)$
- D)  $A' = (0, -1)$ ,  $B' = (6, -3)$ ,  $C' = (1, 3)$ ,  $D' = (-5, 2)$

Ans: D Section: 2.1

12. Reflect  $A$ ,  $B$ ,  $C$ , and  $D$  through the  $x$ -axis and then through the  $y$ -axis and give the coordinates of the reflected points,  $A'$ ,  $B'$ ,  $C'$ , and  $D'$ .

- A)  $A' = (-1, 0)$ ,  $B' = (-3, 6)$ ,  $C' = (3, 1)$ ,  $D' = (2, -5)$
- B)  $A' = (0, -1)$ ,  $B' = (-6, -3)$ ,  $C' = (1, 3)$ ,  $D' = (5, 2)$
- C)  $A' = (0, -1)$ ,  $B' = (6, -3)$ ,  $C' = (1, 3)$ ,  $D' = (-5, 2)$
- D)  $A' = (1, 0)$ ,  $B' = (3, -6)$ ,  $C' = (-3, -1)$ ,  $D' = (-2, 5)$

Ans: C Section: 2.1

Use the following to answer questions 13-14:

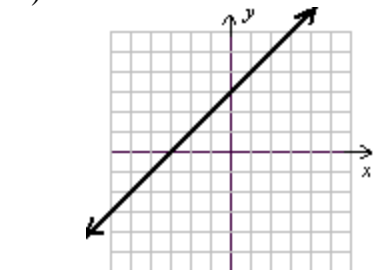
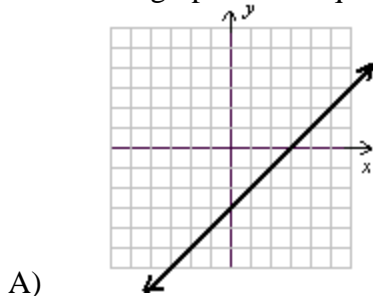
$$y = x - 3$$

13. Test the equation for symmetry with respect to the  $x$ -axis, the  $y$ -axis, and the origin.

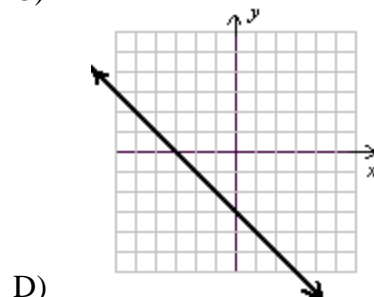
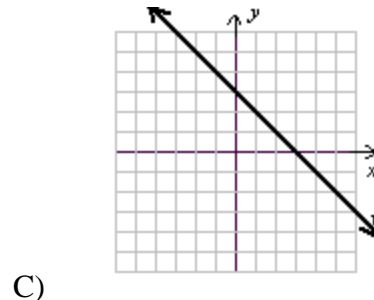
- A) Symmetric with respect to the  $x$ -axis
- B) Symmetric with respect to the  $y$ -axis
- C) Symmetric with respect to the origin
- D) No symmetry with respect to  $x$ -axis,  $y$ -axis, or origin

Ans: D Section: 2.1

14. Sketch the graph of the equation.



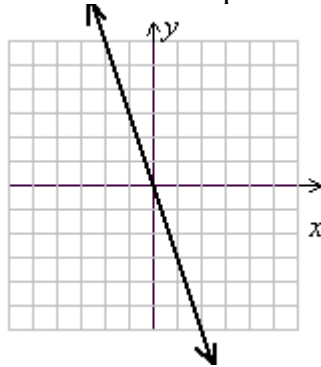
Ans: A Section: 2.1



15. Test the equation for symmetry with respect to the  $x$ -axis, the  $y$ -axis, and the origin. State your results and sketch the graph of the equation.

$$y = -3x$$

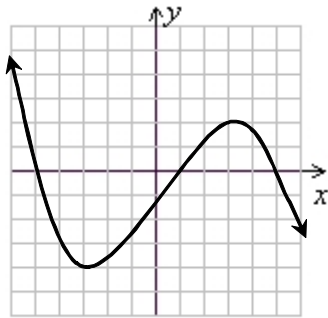
Ans: Symmetric with respect to the origin.



Section: 2.1

Use the following to answer questions 16-21:

Use the graph to estimate to the nearest integer the missing coordinate of the point. (Be sure you find all possible answers.)



16. (3, ?)

Ans: 2

Section: 2.1

17. (-3, ?)

A) -2 B) 2 C) -4 D) -1, -4

Ans: C Section: 2.1

18. (0, ?)

Ans: -1

Section: 2.1

19. (?, -2)

A) -1 B) -4 C) -4, -1 D) -4, -1, 6

Ans: D Section: 2.1

20. (?, 4)

Ans: -6

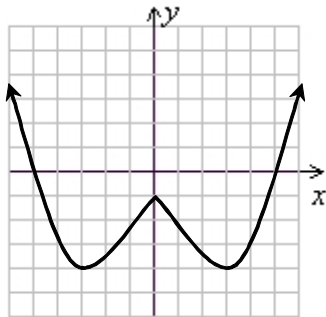
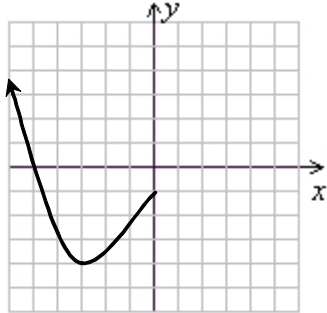
Section: 2.1

21. (?, 0)

Ans: -5, 1, 5

Section: 2.1

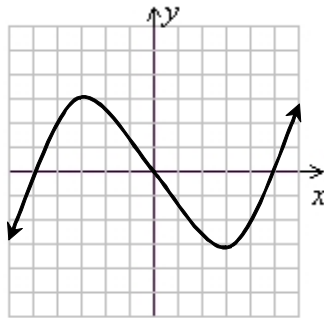
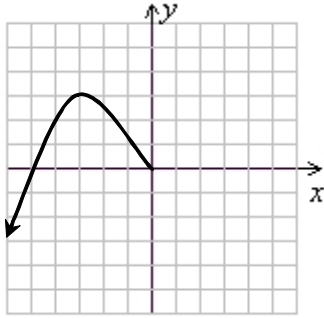
22. A portion of a graph is shown. Extend the graph to one that exhibits y-axis symmetry.



Ans:

Section: 2.1

23. A portion of a graph is shown. Extend the graph to one that exhibits origin symmetry.



Ans:  
Section: 2.1

24. Test the equation for symmetry with respect to the  $x$ -axis, the  $y$ -axis, and the origin.

$$x^2 + 6xy + y^2 = 1$$

- A) Symmetric with respect to the  $x$ -axis
- B) Symmetric with respect to the  $y$ -axis
- C) Symmetric with respect to the origin
- D) Symmetric with respect to the  $x$ -axis, the  $y$ -axis, and the origin

Ans: C Section: 2.1

25. Test the equation for symmetry with respect to the  $x$ -axis, the  $y$ -axis, and the origin.

$$x^2y + 4y^2 = 1$$

- A) Symmetric with respect to the  $x$ -axis
- B) Symmetric with respect to the  $y$ -axis
- C) Symmetric with respect to the origin
- D) Not symmetric with respect to the  $x$ -axis, the  $y$ -axis, or the origin

Ans: B Section: 2.1

26. Test the equation for symmetry with respect to the  $x$ -axis, the  $y$ -axis, and the origin.

$$x^2 - 3xy^2 = 2$$

Ans: Symmetric with respect to the  $x$ -axis  
Section: 2.1

27. Test the equation for symmetry with respect to the  $x$ -axis, the  $y$ -axis, and the origin.

$$x^2 + xy^2 + 2y = 1$$

- A) Symmetric with respect to the  $x$ -axis
- B) Symmetric with respect to the  $y$ -axis
- C) Symmetric with respect to the origin
- D) Not symmetric with respect to the  $x$ -axis, the  $y$ -axis, or the origin

Ans: D Section: 2.1

28. Test the equation for symmetry with respect to the  $x$ -axis, the  $y$ -axis, and the origin.

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

- A) Symmetric with respect to the  $x$ -axis
- B) Symmetric with respect to the  $y$ -axis
- C) Symmetric with respect to the origin
- D) Symmetric with respect to the  $x$ -axis, the  $y$ -axis, and the origin

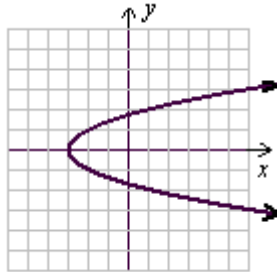
Ans: D Section: 2.1

29. Test the equation for symmetry with respect to the  $x$ -axis, the  $y$ -axis, and the origin.

Sketch the graph of the equation.

$$y^2 = x + 3$$

Ans: Symmetric with respect to the  $x$ -axis



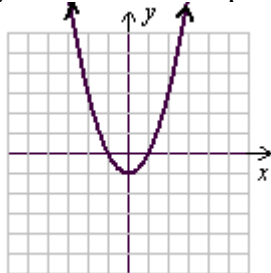
Section: 2.1

30. Test the equation for symmetry with respect to the  $x$ -axis, the  $y$ -axis, and the origin.

Sketch the graph of the equation.

$$y + 1 = x^2$$

Ans: Symmetric with respect to the  $y$ -axis

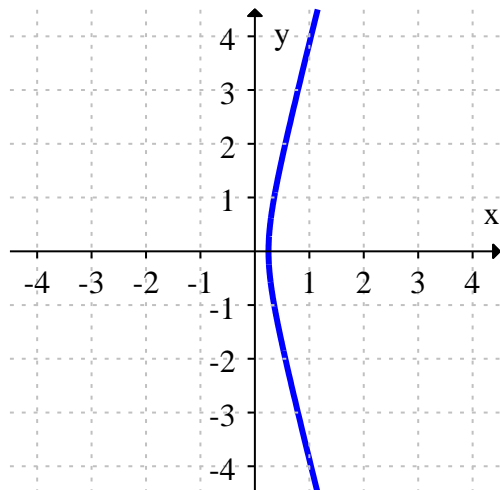


Section: 2.1

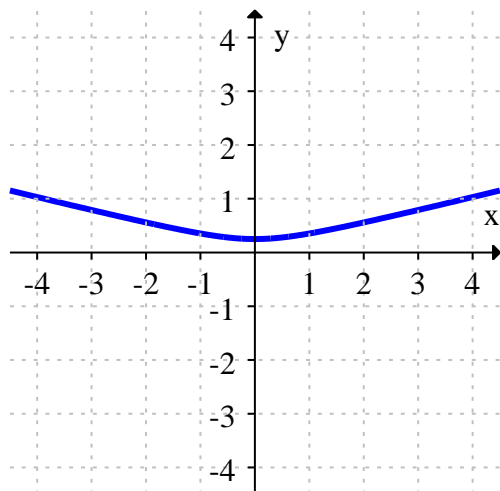
31. Test the equation for symmetry with respect to the  $x$ -axis, the  $y$ -axis, and the origin. Sketch the graph of the equation.

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

- A) Symmetric with respect to the  $x$ -axis

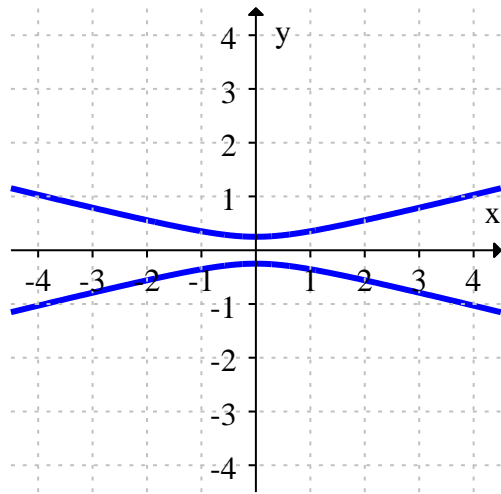


- B) Symmetric with respect to the  $y$ -axis

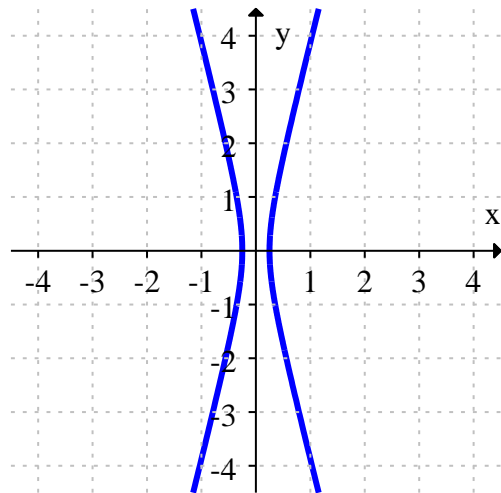


- C) Symmetric with respect to the  $x$ -axis,  $y$ -axis, and origin





D) Symmetric with respect to the  $x$ -axis,  $y$ -axis, and origin

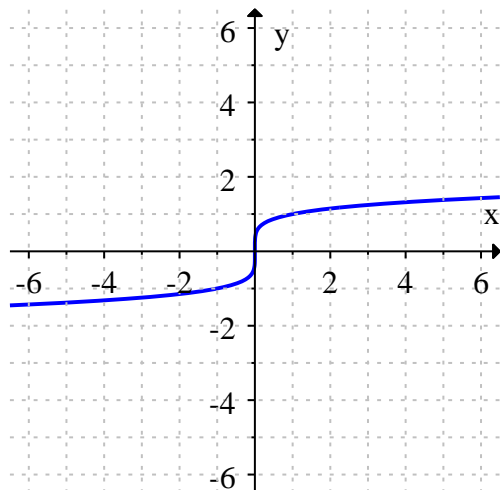


Ans: D Section: 2.1

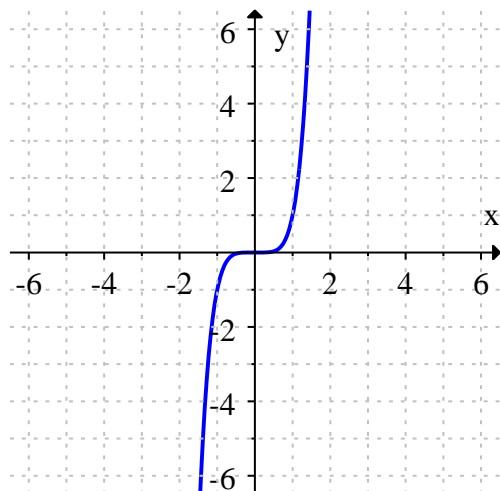
32. Test the equation for symmetry with respect to the  $x$ -axis, the  $y$ -axis, and the origin. Sketch the graph of the equation.

$$y^5 = x$$

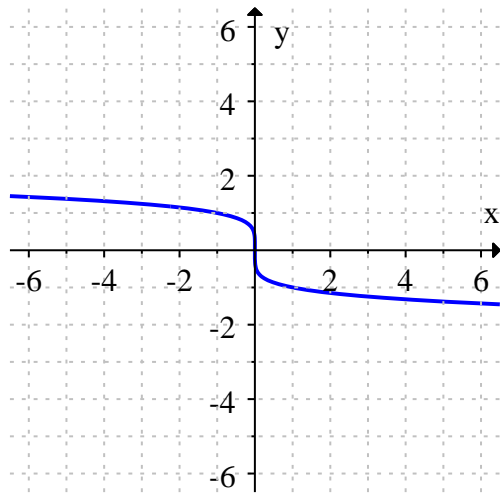
- A) Symmetric with respect to the origin.



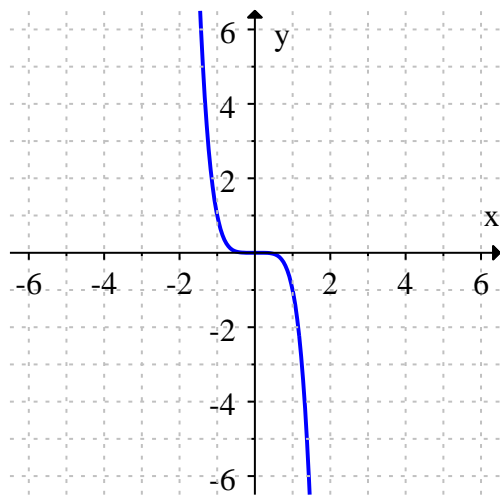
- B) Symmetric with respect to the origin.



- C) Symmetric with respect to the origin.



D) Symmetric with respect to the origin.

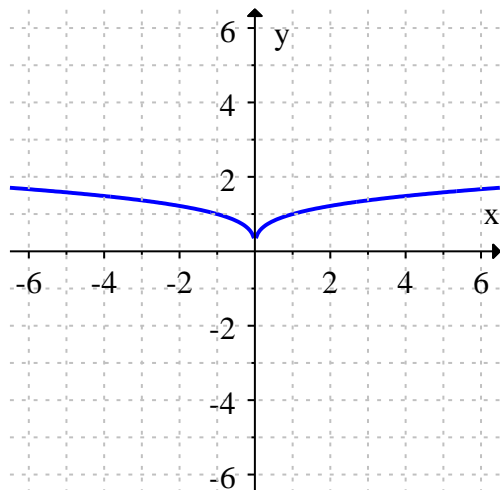


Ans: A Section: 2.1

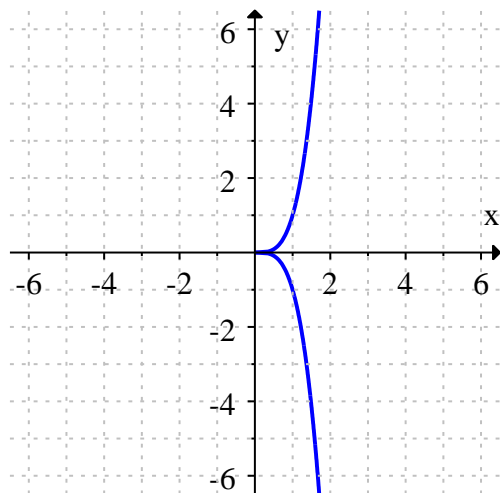
33. Test the equation for symmetry with respect to the  $x$ -axis, the  $y$ -axis, and the origin. Sketch the graph of the equation.

$$y^{2/7} = x$$

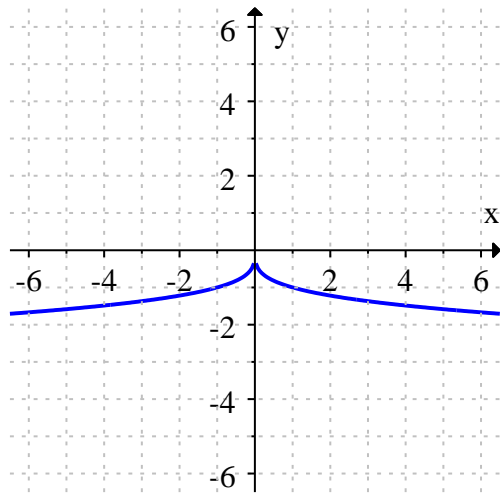
- A) Symmetric with respect to the  $y$ -axis.



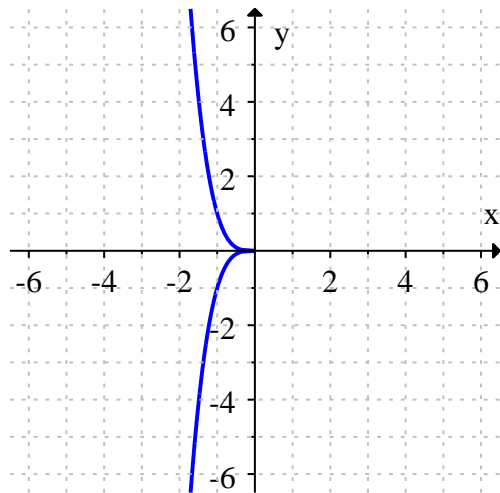
- B) Symmetric with respect to the  $x$ -axis.



- C) Symmetric with respect to the  $y$ -axis.



D) Symmetric with respect to the  $x$ -axis.

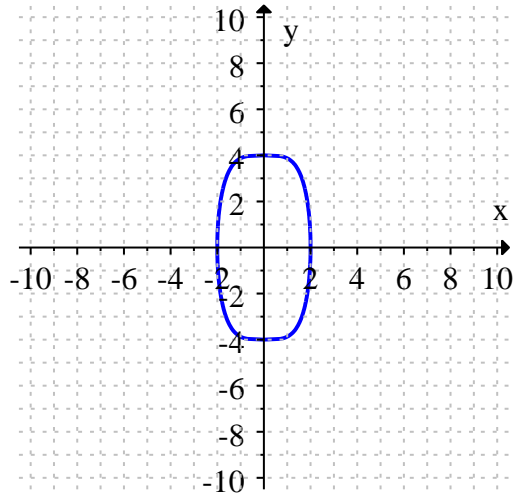


Ans: B Section: 2.1

34. Solve for  $y$ , producing two equations, and then graph both of these equations in the same viewing window.

$$x^4 + y^2 = 16$$

Ans:  $y = \pm\sqrt{16 - x^4}$

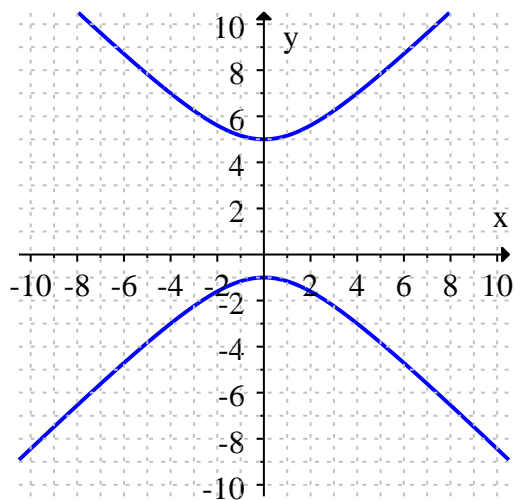


Section: 2.1

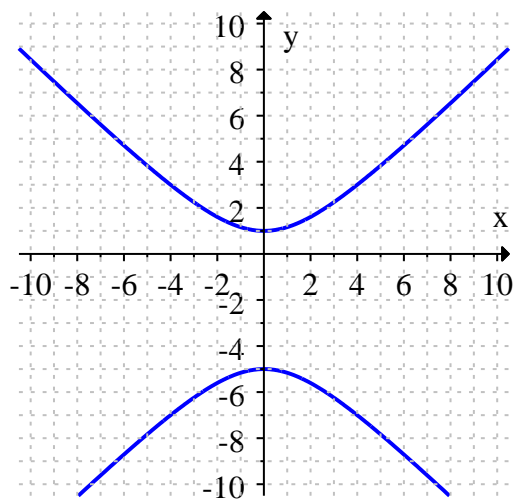
35. Solve for  $y$ , producing two equations, and then graph both of these equations in the same viewing window.

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

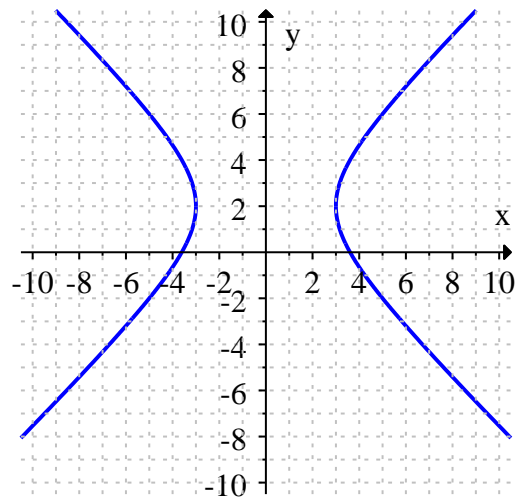
A)  $y = 2 \pm \sqrt{x^2 + 9}$



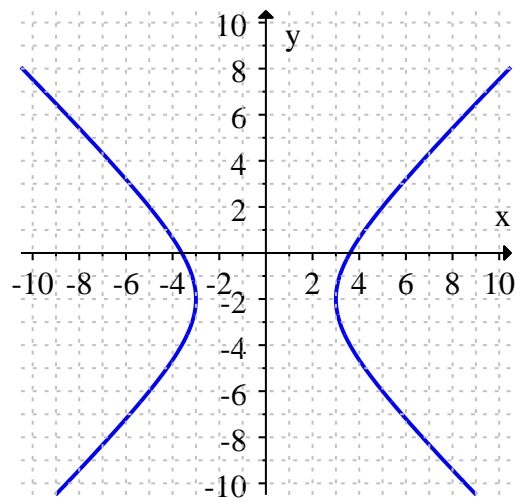
B)  $y = -2 \pm \sqrt{x^2 + 9}$



C)  $y = 2 \pm \sqrt{x^2 - 9}$



D)  $y = -2 \pm \sqrt{x^2 - 9}$



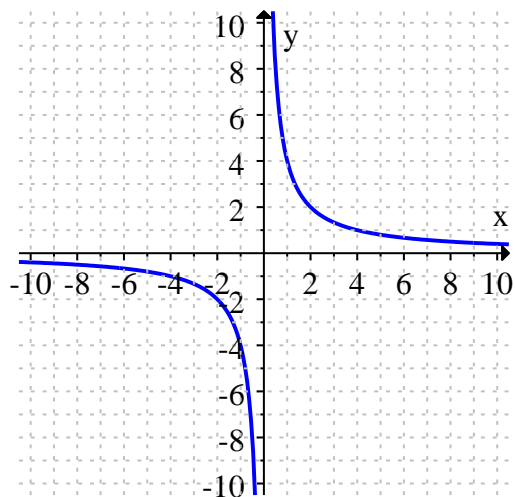
Ans: A Section: 2.1



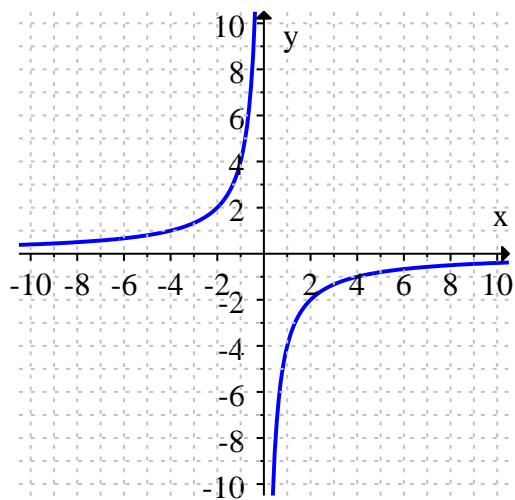
36. Test the equation for symmetry with respect to the  $x$ -axis, the  $y$ -axis, and the origin. Sketch the graph of the equation.

$$xy = 4$$

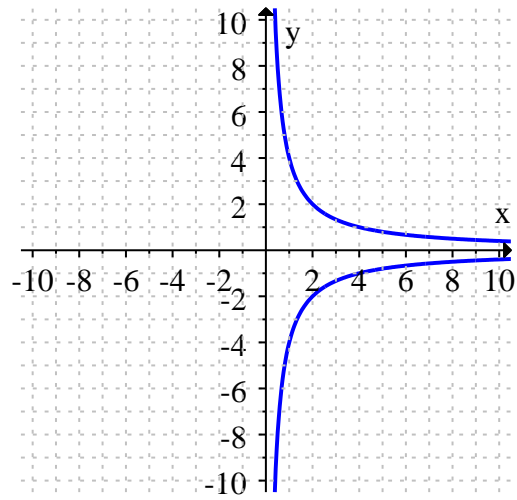
- A) Symmetric with respect to the origin.



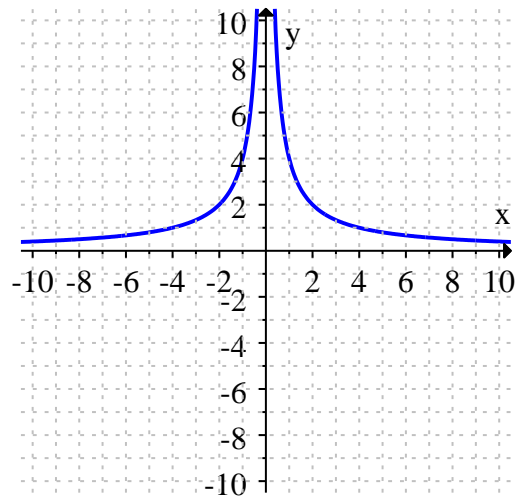
- B) Symmetric with respect to the origin.



- C) Symmetric with respect to the  $x$ -axis.



D) Symmetric with respect to the y-axis.

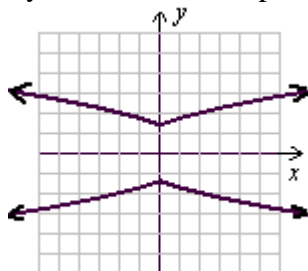


Ans: A Section: 2.1

37. Test the equation for symmetry with respect to the  $x$ -axis, the  $y$ -axis, and the origin. Sketch the graph of the equation.

$$y^2 = |x| + 2$$

Ans: Symmetric with respect to the  $x$ -axis, the  $y$ -axis, and the origin

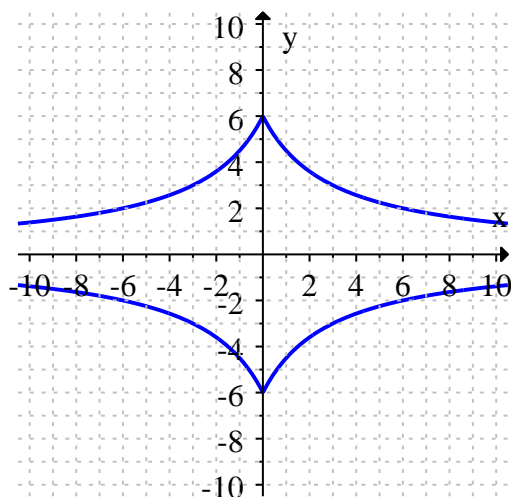


Section: 2.1

38. Test the equation for symmetry with respect to the  $x$ -axis, the  $y$ -axis, and the origin. Sketch the graph of the equation.

$$|xy| + 3|y| = 18$$

Ans: Symmetric with respect to the  $x$ -axis, the  $y$ -axis, and the origin.



Section: 2.1

39. Find the distance between  $(-5, 8)$  and  $(4, -4)$ .

Ans: 15

Section: 2.2

40. Find the midpoint of the line segment with endpoints  $(4, 3)$  and  $(10, 9)$ .

Ans:  $(7, 6)$

Section: 2.2

41. Find the distance between  $(-3, -2)$  and  $(1, 4)$ .

- A) 27   B)  $2\sqrt{5}$    C)  $2\sqrt{13}$    D)  $\sqrt{10}$

Ans: C   Section: 2.2

42. Find the midpoint of the line segment with endpoints  $(0, 3)$  and  $(10, 9)$ .

- A)  $(10, 12)$    B)  $(-10, -6)$    C)  $(5, 6)$    D)  $(-5, -3)$

Ans: C   Section: 2.2

43. Write the equation of a circle with center  $(0, 0)$  and radius 8.

Ans:  $x^2 + y^2 = 64$

Section: 2.2

44. Write the equation of a circle with center  $(0, 0)$  and radius 4.

Ans:  $x^2 + y^2 = 16$

Section: 2.2

45. Write the equation of a circle with center  $(0, 2)$  and radius  $\sqrt{6}$ .

A)  $x^2 + (y - 2)^2 = \sqrt{6}$

C)  $x^2 + (y + 2)^2 = \sqrt{6}$

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

D)  $x^2 + (y + 2)^2 = 6$

Ans: B   Section: 2.2

46. Write the equation of a circle with center  $(2, 4)$  and radius  $\sqrt{2}$ .

A)  $(x - 2)^2 + (y - 4)^2 = \sqrt{2}$

C)  $(x - 2)^2 + (y - 4)^2 = 2$

B)  $(x + 2)^2 + (y + 4)^2 = \sqrt{2}$

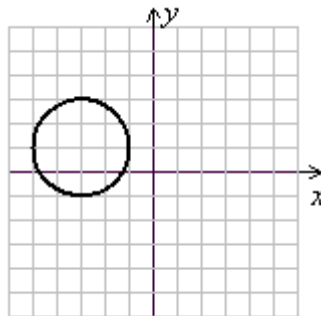
D)  $(x + 2)^2 + (y + 4)^2 = 2$

Ans: C   Section: 2.2

47. Write an equation for the given set of points. Graph your equation.

The set of all points that are two units from  $(-3, 1)$

Ans:  $(x + 3)^2 + (y - 1)^2 = 4$



Section: 2.2

48. The midpoint of the line segment with endpoints  $(0, -1)$  and  $(b_1, b_2)$  is  $(2, 1)$ . Find  $b_1$  and  $b_2$ .

Ans:  $(b_1, b_2) = (4, 3)$

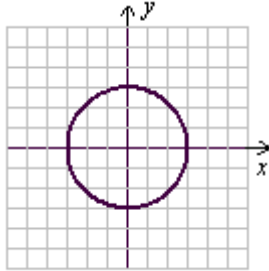
Section: 2.2

49. Find  $x$  such that  $(x, 5)$  is 10 units from  $(-2, 11)$

Ans:  $-10, 6$

Section: 2.2

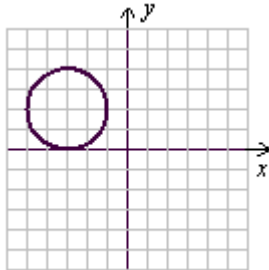
50. Write the equation of the circle.



Ans:  $x^2 + y^2 = 9$

Section: 2.2

51. Write the equation of the circle.



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

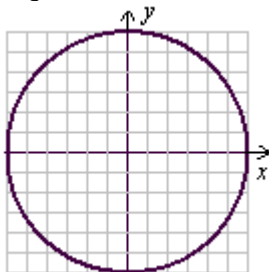
C)  $(x + 3)^2 + (y - 2)^2 = 4$

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

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

Ans: C Section: 2.2

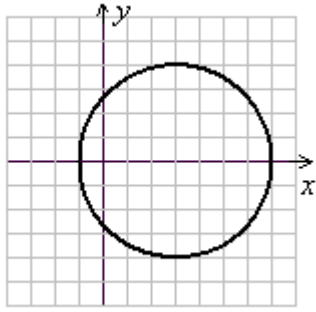
52. Write the equation of the circle.



A)  $x^2 + y^2 = 6$    B)  $x^2 + y^2 = 36$    C)  $6x^2 + 6y^2 = 1$    D)  $y^2 = 6x^2$

Ans: B Section: 2.2

53. Write the equation of the circle.



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

Section: 2.2

54.  $M$  is the midpoint of  $A$  and  $B$ . Find the indicated point. Verify that

$$d(A, M) = d(M, B) = \frac{1}{2}d(A, B).$$

$M = (-5, -9)$ ,  $B = (1, -6)$ ,  $A = ?$

A) (9, 24) B) (-6, -3) C) (6, 3) D) (-11, -12)

Ans: D Section: 2.2

55.  $M$  is the midpoint of  $A$  and  $B$ . Find the indicated point. Verify that

$$d(A, M) = d(M, B) = \frac{1}{2}d(A, B).$$

$A = (13.1, 6.7)$ ,  $M = (7, 1)$ ,  $B = ?$

A) (0.9, -4.7) B) (-6.1, -5.7) C) (6.1, 5.7) D) (-27.1, -8.7)

Ans: A Section: 2.2

56. Find the center and radius of the circle.

$$x^2 + (y - 5)^2 = 49.$$

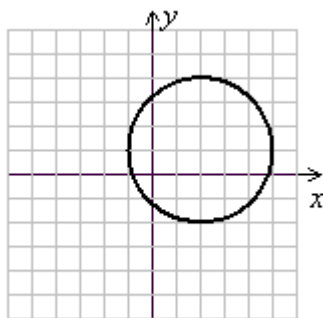
Ans: Center (0, 5), radius 7

Section: 2.2

57. Graph the circle by finding the center and radius.

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

Ans: Center (2, 1), radius 3



Section: 2.2

58. Find the center and radius of the circle.

$$(x - 8)^2 + (y - 5)^2 = 36.$$

A) Center  $(-8, -5)$  and radius 6

C) Center  $(-8, -5)$  and radius 36

B) Center  $(8, 5)$  and radius 6

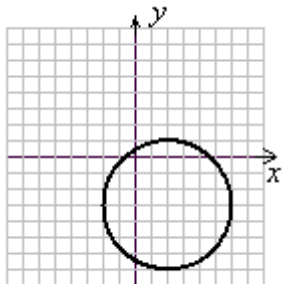
D) Center  $(8, 5)$  and radius 36

Ans: B Section: 2.2

59. Graph the circle by finding the center and radius.

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

Ans: Center  $(2, -3)$ , radius 4



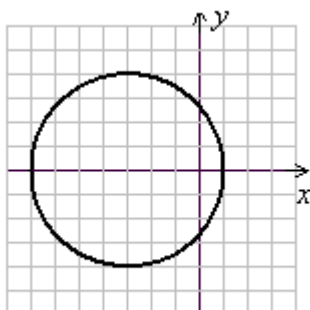
Section: 2.2

60. Graph the circle by finding the center and radius.

$$x^2 + 6x + y^2 = 7$$

$$\text{Ans: } (x + 3)^2 + y^2 = 16$$

Center  $(-3, 0)$ , radius 4



Section: 2.2

61. Find the center and radius of the circle.

$$x^2 + y^2 + 16y = 36$$

Ans: Center  $(0, -8)$ , radius 10

Section: 2.2

62. Find the center and radius of the circle.

$$x^2 + y^2 - 6x - 4y = 13$$

Ans: Center  $(3, 2)$ , radius  $\sqrt{26}$

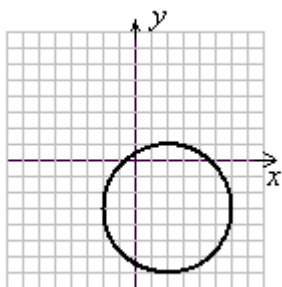
Section: 2.2

63. Graph the circle by finding the center and radius.

$$x^2 + y^2 - 4x + 6y = 3$$

$$\text{Ans: } (x - 2)^2 + (y + 3)^2 = 16$$

Center  $(2, -3)$ , radius 4



Section: 2.2



64. Find the center and radius of the circle.

$$3x^2 + 3y^2 + 36x + 18y - 57 = 0$$

- A) Center  $(-6, -3)$  and radius 8      C) Center  $(-6, -3)$  and radius 64  
B) Center  $(6, 3)$  and radius 8      D) Center  $(6, 3)$  and radius 64

Ans: A    Section: 2.2

65. Write the equation of a circle whose diameter has endpoints  $(2, -7)$  and  $(2, 1)$ .

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

Section: 2.2

66. Find the standard form of the equation of the circle with center  $(5, 0)$  that passes through the point  $(1, 2)$ .

- A)  $(x + 5)^2 + y^2 = 40$       C)  $(x + 5)^2 + y^2 = 1600$   
B)  $(x - 5)^2 + y^2 = 20$       D)  $(x - 5)^2 + y^2 = 400$

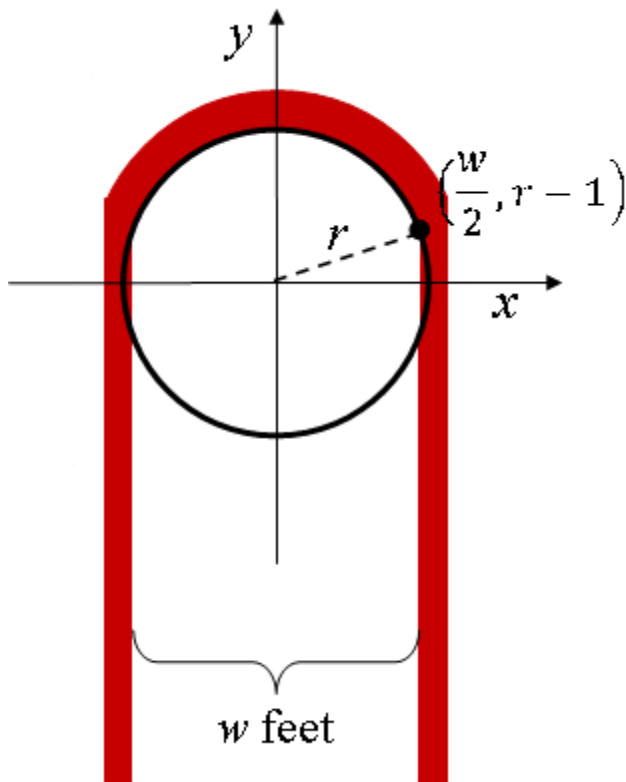
Ans: B    Section: 2.2

67. Find the equation of a circle with center  $(2, -3)$  and the graph of which contains the point  $(3, 4)$ .

- A)  $(x - 2)^2 + (y + 3)^2 = 50$       C)  $(x - 2)^2 + (y + 3)^2 = \sqrt{50}$   
B)  $(x + 2)^2 + (y - 3)^2 = 50$       D)  $(x + 2)^2 + (y - 3)^2 = \sqrt{50}$

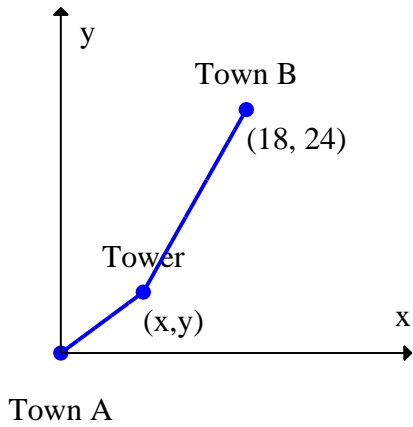
Ans: A    Section: 2.2

68. An arched doorway is formed by placing a circular arc on top of a rectangle (see the figure). If the doorway is  $w = 10$  feet wide and the height of the arc above its ends is 1 foot, what is the radius of the circle containing the arc? [*Hint*: Note that  $(5, r - 1)$  must satisfy  $x^2 + y^2 = r^2$ .]



Ans: 13 feet  
Section: 2.2

69. Town  $B$  is located 18 miles east and 24 miles north of town  $A$  (see the figure). A local telephone company wants to position a relay tower so that the distance from the tower to town  $B$  is twice the distance from the tower to town  $A$ .
- (A) Show that the tower must lie on a circle, and find the center and radius of this circle.
- (B) If the company decides to position the tower on this circle at a point directly east of town  $A$ , how far from town  $A$  should they place the tower? Compute the answer to one decimal place.

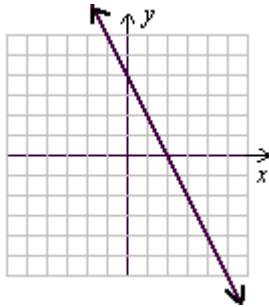


Ans: (A) Center =  $(-6, -8)$ ; radius = 20

(B)  $x = 12.3$  mi

Section: 2.2

Use the following to answer questions 70-73:



70. Find the  $x$ -intercept of the line.

Ans: 2

Section: 2.3

71. Find the  $y$ -intercept of the line.

Ans: 4

Section: 2.3

72. Find the slope of the line.

Ans:  $-2$

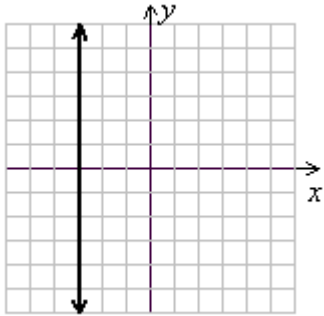
Section: 2.3

73. Write the equation of the line in slope-intercept form.

Ans:  $y = -2x + 4$

Section: 2.3

Use the following to answer questions 74-77:



74. Find the  $x$ -intercept of the line.

A) 3 B) 0 C)  $-3$  D) No  $x$ -intercept

Ans: C Section: 2.3

75. Find the  $y$ -intercept of the line.

A)  $-3$  B) 0 C) 3 D) No  $y$ -intercept

Ans: D Section: 2.3

76. Find the slope of the line.

A)  $-3$  B) 0 C) 3 D) Undefined

Ans: D Section: 2.3

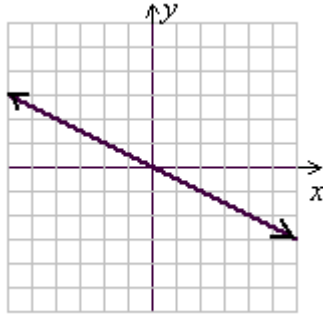
77. Write the equation of the line.

A)  $y = -3x$  B)  $y = 3x$  C)  $x = -3$  D)  $y = -3$

Ans: C Section: 2.3

78. Graph  $y = -\frac{1}{2}x$ . Indicate the slope, if it exists.

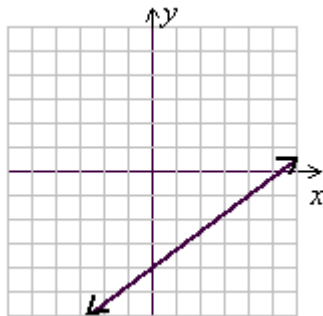
Ans: Slope =  $-\frac{1}{2}$



Section: 2.3

79. Graph  $y = \frac{3}{4}x - 4$ . Indicate the slope, if it exists.

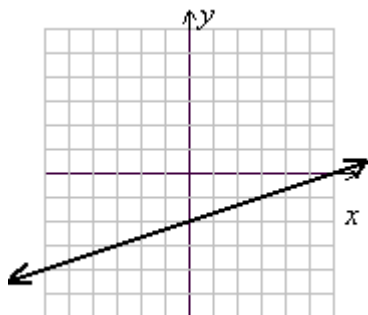
Ans: Slope =  $\frac{3}{4}$



Section: 2.3

80. Graph  $y = \frac{1}{3}x - 2$ . Indicate the slope, if it exists.

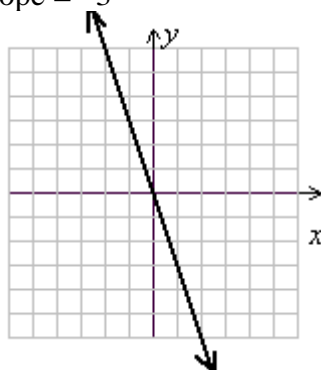
Ans: Slope =  $\frac{1}{3}$



Section: 2.3

81. Graph  $6x + 2y = 0$ . Indicate the slope, if it exists.

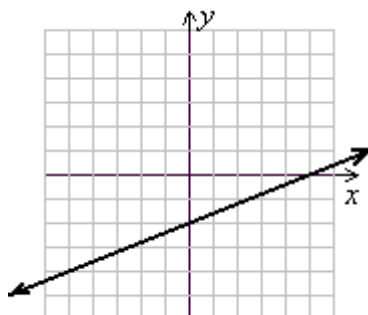
Ans: Slope =  $-3$



Section: 2.3

82. Graph  $2x - 5y = 10$ . Indicate the slope, if it exists.

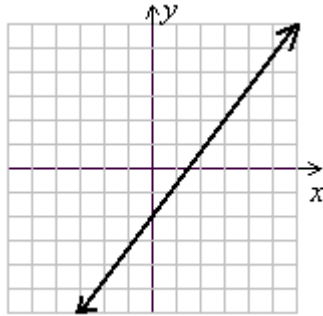
Ans: Slope =  $\frac{2}{5}$



Section: 2.3

83. Graph  $4x - 3y = 6$ . Indicate the slope, if it exists.

Ans: Slope =  $\frac{4}{3}$

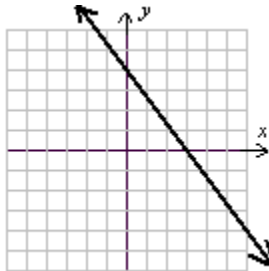


Section: 2.3

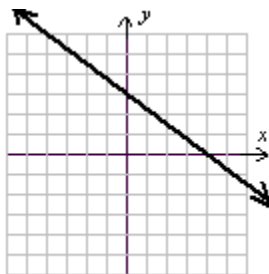
Use the following to answer questions 84-85:

$$3x + 4y = 12$$

84. Graph the line.

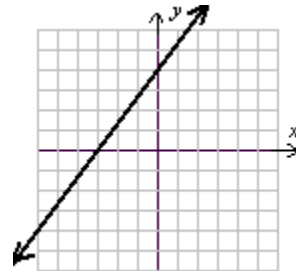


A)

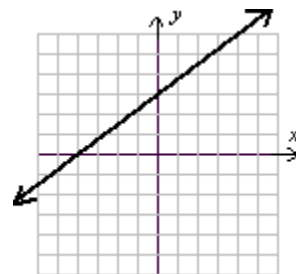


B)

Ans: B Section: 2.3



C)



D)

85. Indicate the slope.

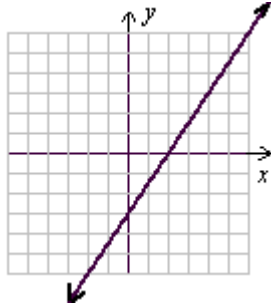
A)  $-\frac{4}{3}$  B)  $\frac{4}{3}$  C)  $-\frac{3}{4}$  D)  $\frac{3}{4}$

Ans: C Section: 2.3

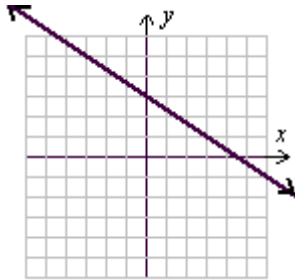
Use the following to answer questions 86-87:

$$3x + 2y = 6$$

86. Graph the line.

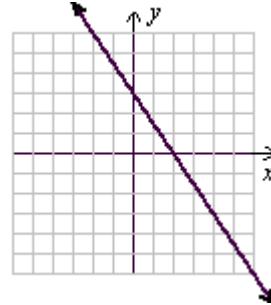


A)

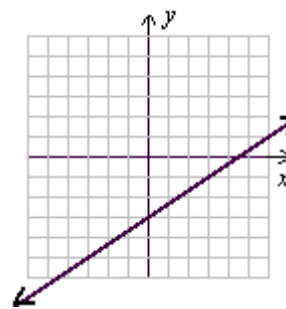


B)

Ans: C Section: 2.3



C)



D)

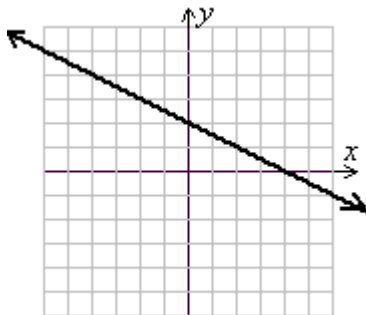
87. Indicate the slope.

A)  $\frac{3}{2}$    B)  $-\frac{3}{2}$    C)  $\frac{2}{3}$    D)  $-\frac{2}{3}$

Ans: B Section: 2.3

88. Graph  $\frac{x}{4} + \frac{y}{2} = 1$ . Indicate the slope, if it exists.

Ans: Slope =  $-\frac{1}{2}$

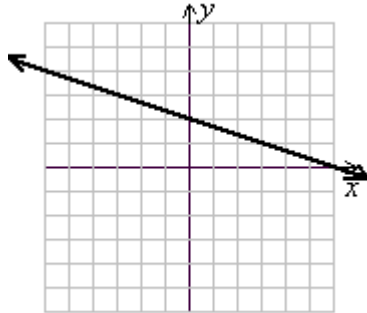


Section: 2.3



89. Graph  $\frac{x}{6} + \frac{y}{2} = 1$ . Indicate the slope, if it exists.

Ans: Slope =  $-\frac{1}{3}$

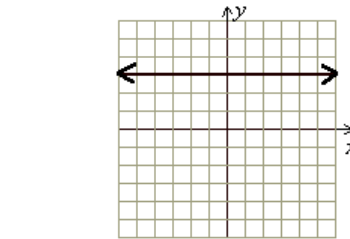
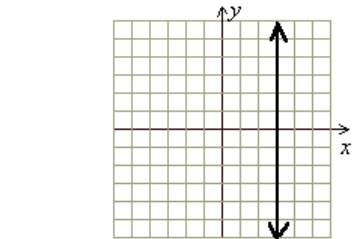
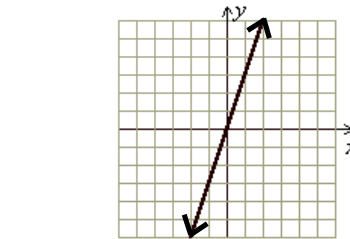
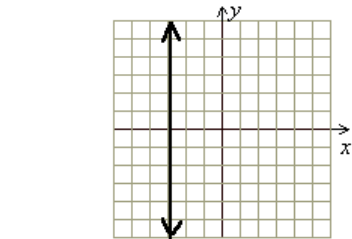


Section: 2.3

Use the following to answer questions 90-91:

$$x = 3$$

90. Graph the line.



Ans: B Section: 2.3

91. Indicate the slope, if it exists.

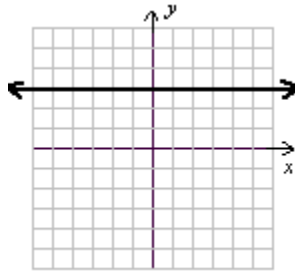
A) 3 B) 0 C) -3 D) Undefined

Ans: D Section: 2.3

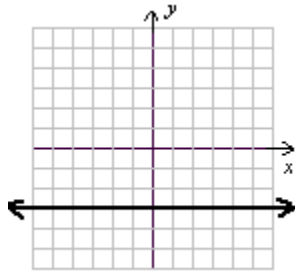
Use the following to answer questions 92-93:

$$y = -3$$

92. Graph the line.

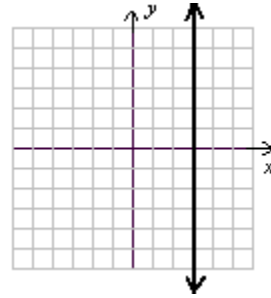


A)

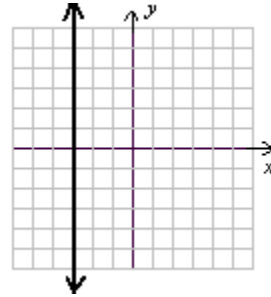


B)

Ans: B Section: 2.3



C)



D)

93. Indicate the slope, if it exists.

A) 3 B) 0 C) -3 D) Undefined

Ans: B Section: 2.3

94. Find the equation of the line with slope  $-6$  and  $y$ -intercept  $4$ . Write the equation in standard form

$Ax + By = C, A \geq 0$ .

A)  $6x - y = 4$  B)  $6x - y = -4$  C)  $6x + y = 4$  D)  $6x + y = -4$

Ans: C Section: 2.3

95. Write the equation of the line with slope  $\frac{2}{3}$  and  $y$ -intercept  $-5$ . Write the equation in

standard form  $Ax + By = C, A \geq 0$ .

Ans:  $2x - 3y = 15$

Section: 2.3

96. Write the equation of the line with slope  $-\frac{1}{2}$  and  $y$ -intercept  $3$ . Write the equation in

standard form  $Ax + By = C, A \geq 0$ .

Ans:  $x + 2y = 6$

Section: 2.3

97. Write the equation of the line with slope  $0$  and  $y$ -intercept  $-3$ . Write the equation in standard form  $Ax + By = C, A \geq 0$ .

A)  $-3x - y = 0$  B)  $-3x + y = 0$  C)  $y = -3$  D)  $x = -3$

Ans: C Section: 2.3

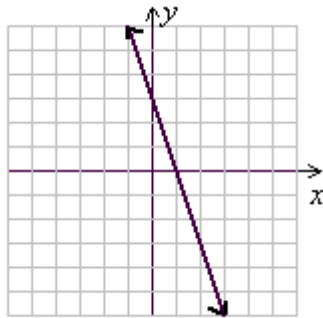
98. Write the equation of the line that passes through point  $(0, 3)$  with slope  $-\frac{9}{4}$ . Give your answer in the slope-intercept form  $y = mx + b$ .

Ans:  $y = -\frac{9}{4}x + 3$

Section: 2.3

99. Sketch a graph of the line that contains the point  $(0, 3)$  and has slope  $-3$ . Then write the equation of the line in the slope intercept form  $y = mx + b$ .

Ans:  $y = -3x + 3$ .



Section: 2.3

100. Write the equation of the line that passes through point  $(-3, 15)$  with a slope of  $-3$ . Give your answer in the slope-intercept form  $y = mx + b$ .

Ans:  $y = -3x + 6$

Section: 2.3

101. Write the equation of the line passing through  $(4, -13)$  and  $(-3, 1)$ . Write your answer in the slope-intercept form  $y = mx + b$ .

Ans:  $y = -2x - 5$

Section: 2.3

102. Write the equation of the line passing through  $(-3, -5)$  and  $(3, 0)$ . Write your answer in the slope-intercept form  $y = mx + b$ .

A)  $y = -\frac{6}{5}x - \frac{5}{2}$     B)  $y = \frac{5}{6}x - \frac{5}{2}$     C)  $y = \frac{5}{6}x + \frac{2}{5}$     D)  $y = -\frac{6}{5}x + \frac{2}{5}$

Ans: B    Section: 2.3

103. Write the equation of the line passing through  $(3, -9)$  and  $(6, -9)$ . Write your answer in the slope-intercept form  $y = mx + b$ .

Ans:  $y = -9$

Section: 2.3

104. Write the equation of the line passing through  $(-2, -8)$  and  $(-2, -6)$ .  
 A)  $x = -2$  B)  $y = -2$  C)  $y = x - 2$  D)  $y = 2x$   
 Ans: A Section: 2.3
105. Write the equation of the line with  $x$ -intercept  $(-12, 0)$  and  $y$ -intercept  $(0, 3)$ . Write your answer in the slope-intercept form  $y = mx + b$ .  
 Ans:  $y = \frac{1}{4}x + 3$   
 Section: 2.3
106. Write an equation of the line passing through  $(3, 13)$  and parallel to  $y = 7x + 8$ . Write your answer in standard form  $Ax + By = C$ ,  $A \geq 0$ .  
 Ans:  $7x - y = 8$   
 Section: 2.3
107. Write an equation of the line passing through  $(-8, -3)$  and perpendicular to  $y = \frac{1}{4}x + 2$ .  
 Write your answer in standard form  $Ax + By = C$ ,  $A \geq 0$ .  
 A)  $4x + y = -35$  B)  $4x - y = -35$  C)  $x + 4y = -20$  D)  $x - 4y = -20$   
 Ans: A Section: 2.3
108. Write the equation of the line passing through  $(0, 5)$  and perpendicular to  $x - 5y = 20$ . Write your answer in standard form  $Ax + By = C$ ,  $A \geq 0$ .  
 Ans:  $5x + y = 5$   
 Section: 2.3
109. Write the equation of the line which passes through  $(2, -1)$  and is perpendicular to the line with equation  $3y - x = 1$ .  
 A)  $3x + y = 5$  B)  $3x - y = 7$  C)  $x + 3y = -1$  D)  $x - 3y = 5$   
 Ans: A Section: 2.3
110. Refer to the quadrilateral with vertices  $P = (5, 3)$ ,  $Q = (17, 33)$ ,  $R = (27, 29)$ , and  $S = (15, -1)$ . Show that  $PQ \parallel SR$ .  
 A)  $m_{PQ} = m_{SR} = \frac{5}{2}$  C)  $m_{PQ} m_{SR} = \left(\frac{5}{2}\right)\left(-\frac{2}{5}\right) = -1$   
 B)  $m_{PQ} = m_{SR} = -\frac{5}{2}$  D)  $m_{PQ} m_{SR} = \left(-\frac{5}{2}\right)\left(\frac{2}{5}\right) = -1$   
 Ans: A Section: 2.3

111. Refer to the quadrilateral with vertices  $P = (-6, -5)$ ,  $Q = (-2, 1)$ ,  $R = (10, -7)$ , and  $S = (6, -13)$ . Show that  $PQ \perp QR$ .

A)  $m_{PQ} = m_{QR} = \frac{3}{2}$

C)  $m_{PQ} m_{QR} = \left(\frac{3}{2}\right)\left(-\frac{2}{3}\right) = -1$

B)  $m_{PQ} = m_{QR} = -\frac{3}{2}$

D)  $m_{PQ} m_{QR} = \left(-\frac{3}{2}\right)\left(\frac{2}{3}\right) = -1$

Ans: C Section: 2.3

112. Refer to the quadrilateral with vertices  $P = (-10, -3)$ ,  $Q = (-2, 9)$ ,  $R = (4, 5)$ , and  $S = (-4, -7)$ . Find an equation of the perpendicular bisector of  $PQ$ . The perpendicular bisector of a line segment is a line perpendicular to the segment and passing through its midpoint.

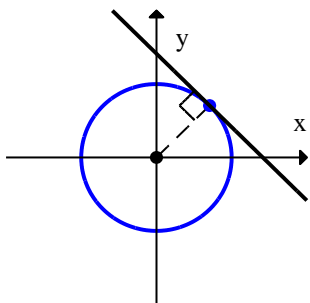
Write your answer in standard form  $Ax + By = C$ ,  $A \geq 0$ .

A)  $2x + 3y = 3$    B)  $2x + 3y = -3$    C)  $2x - 3y = 3$    D)  $2x - 3y = -3$

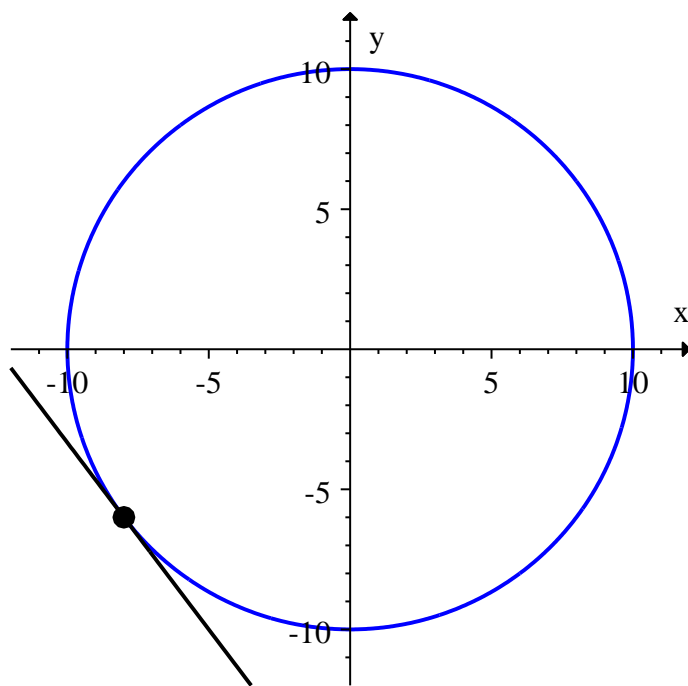
Ans: B Section: 2.3

113. Recall that a line tangent to a circle at a point is perpendicular to the radius drawn to that point (see the figure). Find the equation of the line tangent to the circle at the indicated point. Write the answer in the standard form  $Ax + By = C$ ,  $A \geq 0$ . Graph the circle and the tangent line on the same coordinate system.

$$x^2 + y^2 = 100, (-8, -6)$$



Ans:  $4x + 3y = -50$



Section: 2.3

Use the following to answer questions 114-115:

The Number Two Plumbing Co. charges \$35 per hour plus a fixed service call charge of \$65.

114. Write an equation that will allow you to compute the total bill for any number of hours,  $x$ , that it takes to complete a job.

A)  $C = 30x + 45$  B)  $C = 45x + 30$  C)  $45x + 30C = 0$  D)  $30x + 45C = 0$

Ans: A Section: 2.3

115. If the bill comes to \$120.25, how many hours did the job take?

A) 1.85 hours B) 2.05 hours C) 2.15 hours D) 2.35 hours

Ans: C Section: 2.3

Use the following to answer questions 116-119:

A driver going down a straight highway is traveling at 70 ft/sec on cruise control when he begins accelerating at a rate of  $4.2 \text{ ft/sec}^2$ . The velocity of the car in ft/sec is given by the function  $V = 4.2t + 70$ , where  $t$  is in seconds.

116. Interpret the meaning of the slope of this model.

Ans: Every second the velocity is increasing by 4.2 ft/sec.

Section: 2.4

117. What is the effect of a 1 second increase in time traveled?

Ans: The velocity increases by 4.2 ft/sec.

Section: 2.4

118. Determine the velocity of the car after 10.4 seconds.

A) 111.40 ft/sec B) 112.32 ft/sec C) 113.68 ft/sec D) 114.54 ft/sec

Ans: C Section: 2.4

119. If the car is traveling at 100 ft/sec, for how long did it accelerate? (Round to the nearest tenth of a second.)

A) 6.9 seconds B) 7.1 seconds C) 7.3 seconds D) 7.5 seconds

Ans: B Section: 2.4

120. The speed of sound through the air near sea level is linearly related to the temperature of the air. If sound travels at 1122 ft/sec when the air temperature is  $64^\circ\text{F}$  and at 1144 ft/sec when the air temperature is  $84^\circ\text{F}$ :

(a) Construct a linear model relating the speed of sound  $s$  to the air temperature  $t$ .

(b) Interpret the slope of this model.

Ans: (a)  $s = 1.1t + 1051.6$

(b) The speed of sound increases 1.1 ft/sec for each  $1^\circ\text{F}$  increase in temperature.

Section: 2.4

Use the following to answer questions 121-124:

A business purchases a copier for \$7,500 and anticipates it will be worth \$4,500 after 5 years.

121. Use straight-line depreciation to find a linear model for the depreciated value  $V$  of the copy machine after  $t$  years of use.

- A)  $V = -7,500 + 300t$                       C)  $V = -300 + 7,500t$   
 B)  $V = 300 - 7,500t$                       D)  $V = 7,500 - 300t$

Ans: D    Section: 2.4

122. Interpret the slope of the linear model for the depreciated value of the copy machine.

- A) The copier's value is decreasing by \$400 per year.  
 B) The copier's value is decreasing by \$7,500 per year.  
 C) The copier's original value was \$400.  
 D) The copier's original value was \$7,500.

Ans: A    Section: 2.4

123. What is the copier's value after 4 years of use?

- A) \$8,250    B) \$8,300    C) \$8,350    D) \$8,400

Ans: B    Section: 2.4

124. How many years will it take for the copier's value to decrease to \$1700?

- A) 4 years    B) 5 years    C) 6 years    D) 7 years

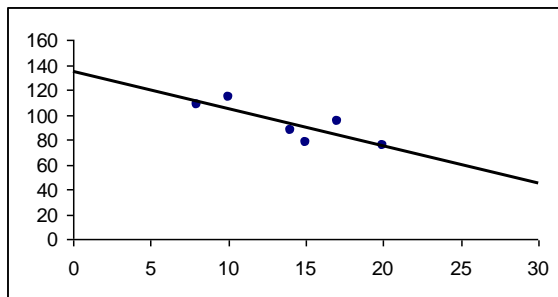
Ans: D    Section: 2.4

Use the following to answer questions 125-126:

The regression model for the data shown in the table is  $y = -3.0x + 134.6$ .

$x$	$y$
10	114
8	108
15	77
14	87
20	75
17	94

125. Plot the data and the model on the same axes.



Ans:

Section: 2.4



126. Use the model to estimate  $y$  when  $x = 18.5$ .

A) 78.7 B) 78.9 C) 79.1 D) 79.3

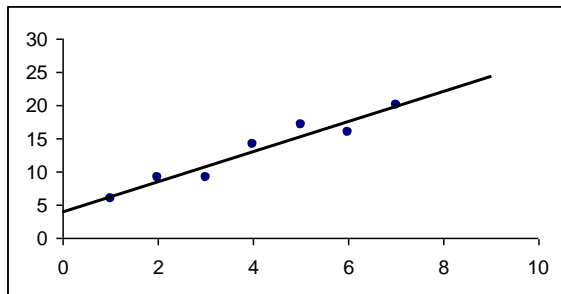
Ans: C Section: 2.4

Use the following to answer questions 127-128:

The regression model for the data shown in the table is  $y = 2.3x + 3.9$ .

$x$	$y$
4	14
1	6
3	9
2	9
5	17
7	20
6	16

127. Plot the data and the model on the same axes.



Ans:

Section: 2.4

128. Use the model to estimate  $y$  when  $x = 5.5$ .

Ans: 16.55

Section: 2.4