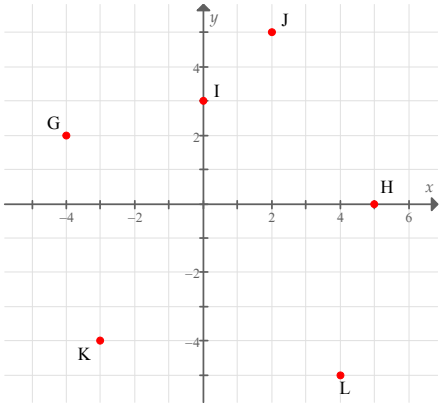
Exercise Set 2.1: An Introduction to the Coordinate Plane

Plot the following points in a coordinate plane.

1. A(3, 4)
2. B(2, -5)
3. C(-3, -1)
4. D(-4, -6)
5. E(-5, 0)
6. F(0, -2)

Write the coordinates of each of the points shown in the figure below. Then identify the quadrant or axis in which the point is located.

7. G
8. H
9. I
10. J
11. K
12. L



Plot each of the following sets of points in a coordinate plane. Then identify the quadrant or axis in which each point is located.

13. **(a)** A(2, 5) **(b)** B(-2, -5) **(c)** C(2, -5) **(d)** D(-2, 5)

14. **(a)** A(4, -3) **(b)** B(-4, -3) **(c)** C(-4, 3) **(d)** D(4, 3)

15. **(a)** A(0, -2) **(b)** B(-2, 0) **(c)** C(2, 0) **(d)** D(0, 2)

16. **(a)** A(-3, 0) **(b)** B(3, 0) **(c)** (0, -3) **(d)** D(0, 3)

17. If the point (a, b) is in Quadrant I, identify the quadrant of each of the following points:
(a) $(-a, -b)$ **(b)** $(-a, b)$ **(c)** (a, a)

18. If the point (a, b) is in Quadrant I, identify the quadrant of each of the following points:
(a) $(-b, a)$ **(b)** (b, b) **(c)** $(-b, -a)$

19. If the point (a, b) is in Quadrant II, then $a < 0$ and $b > 0$. Identify the quadrant of each of the following points:
(a) $(-a, -b)$ **(b)** (b, a) **(c)** $(a, -b)$

20. If the point (a, b) is in Quadrant III, then $a < 0$ and $b < 0$. Identify the quadrant of each of the following points:
(a) $(-a, b)$ **(b)** (b, a) **(c)** $(-a, -b)$

21. If the point (a, b) is in Quadrant IV, identify the quadrant of each of the following points:
(a) $(b, -b)$ **(b)** $(-a, -a)$ **(c)** (b, a)

22. If the point (a, b) is in Quadrant II, identify the quadrant of each of the following points:
(a) $(-a, b)$ **(b)** (b, b) **(c)** $(a, -a)$

23. If the point (a, b) is in Quadrant III, identify the axis on which each of the following points lies:
(a) $(a, 0)$ **(b)** $(0, b)$ **(c)** $(-b, 0)$

24. If the point (a, b) is in Quadrant IV, identify the axis on which each of the following points lies:
(a) $(0, -b)$ **(b)** $(-a, 0)$ **(c)** $(b, 0)$

Answer True or False.

25. The point (0, 5) is on the x-axis.

26. The point (-4, 0) is in Quadrant II.

27. The point (1, -3) is in Quadrant IV.

28. The point (-2, -5) is in Quadrant III.

29. The point (0, 0) is in Quadrant I.

30. The point (-6, 1) is in Quadrant IV.

31. If the point (a, b) is in Quadrant IV, then $b < 0$.

32. If the point (a, b) is in Quadrant II, then $a > 0$.

33. If the point (a, b) is in Quadrant I, then the point (b, a) is also in Quadrant I.

34. If the point (a, b) is in Quadrant I, then the point $(a, -b)$ is in Quadrant II.

35. If the point (a, b) is in Quadrant II, then the point $(-a, -b)$ is in Quadrant III .

36. If the point (a, b) is in Quadrant IV, then the point $(-b, a)$ is in Quadrant I.

37. If the point (a, b) is in Quadrant III, then $b > 0$.

38. If the point (a, b) is on the y-axis, then $a > 0$.

39. If the point (a, b) is on the y-axis, then $b > 0$.

40. If the point (a, b) is on the y-axis, then $a = 0$.

41. If the point (a, b) is on the y-axis, then the point (b, a) is on the x-axis.

42. If the point (a, b) is on the x-axis, then the point $(a, 3)$ lies in Quadrant I .

Answer the following.

43. Given the following points:
A(3, 5), B(3, 1), C(3, 0), D(3, -2)

- **(a)** Plot the above points on a coordinate plane.
- **(b)** What do the above points have in common?
- **(c)** Draw a line through the above points.
- **(d)** What is the equation of the line drawn in part (c)?

44. Given the following points:
A(-3, 4), B(0, 4), C(1, 4), D(3, 4)

- **(a)** Plot the above points on a coordinate plane.
- **(b)** What do the above points have in common?
- **(c)** Draw a line through the above points.
- **(d)** What is the equation of the line drawn in part (c)?

45.
- **(a)** List four points that are on the x-axis.
- **(b)** Analyze the coordinates of the points you have listed. What do they have in common?
- **(c)** Give the equation of the x-axis.

46.
- **(a)** List four points that are on the y-axis.
- **(b)** Analyze the coordinates of the points you have listed. What do they have in common?
- **(c)** Give the equation of the y-axis.

47. Graph the line $x = 2$.

48. Graph the line $y = -5$.

49. Graph the line $y = 4$.

50. Graph the line $x = -3$.

51. On the same set of axes, graph the lines $x = -1$ and $y = 3$.

52. On the same set of axes, graph the lines $x = 5$ and $y = -2$.

53. On the same set of axes, graph the lines $x = \frac{7}{2}$ and $y = 0$.

54. On the same set of axes, graph the lines $x = 0$ and $y = -\frac{5}{2}$.

Graph the following lines by first completing the table and then plotting the points on a coordinate plane.

55. $y = 3x + 2$

x	*y*
-2	
-1	
0	
1	
2	

56. $y = -2x + 5$

x	*y*
-2	
-1	
0	
1	
2	

57. $y = -4x + 7$

x	y
0	
$\frac{1}{4}$	
	-5
	2
$-\frac{3}{2}$	

58. $y = 5x - 1$

x	y
2	
	-1
$\frac{3}{5}$	
	-6
	0

Answer the following.

59. Graph the line segment with endpoints (-7, 0) and (0, 7).

60. Graph the line segment with endpoints (3, 5) and and (-5, -3).

61. Graph the line segment with endpoints (1, -4) and (-1, 4)

62. Graph the line segment with endpoints (-2, 6) and (6, 2).