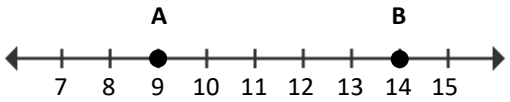
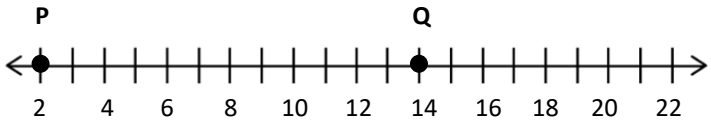
Coordinate Geometry

1. On the number line below point A has a weight of 30% and point B has a weight of 70%. What is the weighted average of points A and B?



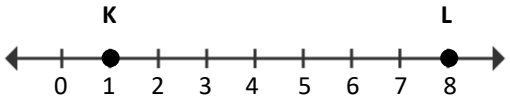
   A. 5
   B. 11.5
   C. 12.5
   D. 23

2. On the number line below point P has a weight of $\frac{5}{6}$ and point Q has a weight of $\frac{1}{6}$. What is the weighted average of points P and Q?



   A. 4
   B. 8
   C. 12
   D. 16

3. Points K and L are shown on the number line below. If the weights of points K and L are the same, which statements are true?

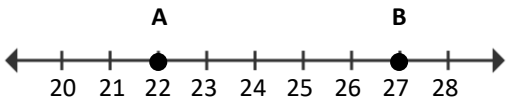


   A. The weighted average, of K and L cannot be determined.
   B. The weighted average of K and L is lesser than 4.5.
   C. The weighted average of K and L is greater than 4.5.
   D. The weighted average of K and L is 4.5.

4. On the number line, the coordinates of points A and B are 11 and 23 respectively. If the weight of A is $\frac{1}{3}$ and the weight of B is $\frac{4}{6}$, what is the weighted average of points A and B?

Coordinate Geometry

5. Points A and B are shown in the number line.



Flora finds the weighted average, w_1 of points A and B by considering their weights as 0.8 and 0.2 respectively. After a while, she finds the weighted average, w_2, of points A and B considering their weights as 0.2 and 0.8 respectively. Select All the statements that are true.

A. w_1 is lesser than w_2

B. w_1 is greater than w_2

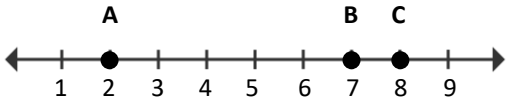
C. w_1 is closer to A than B

D. w_2 is closer to B than A

E. w_1 is 23

F. w_1 is 26

6. Points A, B, and C, shown on the number line, have weights w_A, w_B, and w_C respectively.



Part A: What is the weighted average of the points A, B, and C if $w_A = 30\%$, $w_B = 10\%$, and $w_C = 60\%$?

A. 1.70

B. 1.89

C. 5.67

D. 6.10

Part B: If the weights of A and C are interchanged to 60% and 30% respectively and the weight of B remains the same, which of the following statements are true? Select All that apply.

A. The new weighted average is greater than the weighted average found in Part A.

B. The new weighted average is to the left of the weighted average found in Part A.

C. The new weighted average is closer to B than the weighted average found in Part A.

D. The new weighted average is 1.43.

E. The new weighted average is 4.3.

7. Segment XY has endpoints at $X(-2, 7)$ and $Y(3, 1)$. What is the midpoint of $\overline{XY}$? Enter your answer in the box below.

Coordinate Geometry

8. Segment MN has endpoints at $M(2,5)$ and $N(-4,3)$. What is the midpoint of $\overline{MN}$? Enter your answer in the box below.

9. The endpoints of the diameter of a circle are $(-6,0)$ and $(0,8)$. What are the coordinates of the center of the circle? Enter your answer in the box below.

10. The coordinates of the midpoint of a line segment are $(-7,3)$. The coordinates of 1 endpoint of the line segment are $(-3,1)$. What are the coordinates of the other endpoint?

    A. $(-17,7)$
    B. $(-11,5)$
    C. $(-5,2)$
    D. $(-4,2)$

11. Find the coordinates of the other endpoint of a segment with an endpoint of $(13\ ,5)$ and midpoint $(8\ ,3)$.

    A. $(18\ ,7)$
    B. $(18\ ,1)$
    C. $(-5\ ,-2)$
    D. $(3\ ,1)$

12. Point A is located at $(6,3)$ and point D is at $(18,21)$. If points B and C are located on $\overline{AD}$ such that the ratio $AB:BC:CD$ is equal to $1:1:1$, what are the coordinates of points B and C?

    A. $B(9,7.5)$ and $C(12,12)$
    B. $B(10,9)$ and $C(14,15)$
    C. $B(14,11)$ and $C(26,19)$
    D. $B(12,12)$ and $C(15,16.5)$

13. Point P divides the directed line segment from point $A(-4,-1)$ to point $B(6,4)$ in the ratio $2:3$. The coordinates of point P are

    A. $(-1,1)$
    B. $(0,1)$
    C. $(1,0)$
    D. $(2,2)$

Coordinate Geometry

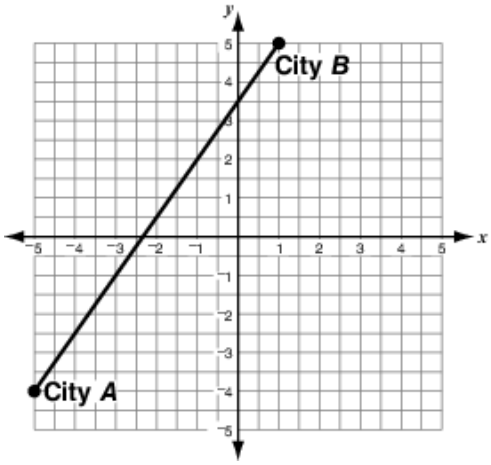
14. A line segment has endpoints at $A(-7,11)$ and $B(5,-5)$. Point K lies on the line segment. Which coordinates for point K result in the ratio of AK to KB of $3:1$?

    A. $(2,-1)$
    B. $(-4,7)$
    C. $(7,-4)$
    D. $(-1,2)$

15. Point R divides a line segment with endpoints $P(4,5)$ and $Q(10,14)$ in the ratio such as that $PR:RQ = 1:2$. What are the coordinates of point R?

    A. $(6,8)$
    B. $(8,6)$
    C. $(8,11)$
    D. $(11,8)$

16. A highway connecting two cities is represented on the coordinate plane below. The highway has two rest areas along the route such that they divide the distance between the cities into three equal parts.



Part A. In what ratio does the rest area closest to city A divide the distance from city A to city B?

    A. 1:2
    B. 1:3
    C. 2:1
    D. 2:3

Part B. What are the coordinates of the point representing the first rest area?

    A. $(-3,-1)$
    B. $(-1,-3)$
    C. $(-1,2)$
    D. $(2,-1)$

Part C. What are the coordinates of the point representing the second rest area?

    A. $(-3,-1)$
    B. $(-1,-3)$
    C. $(-1,2)$
    D. $(2,-1)$

Part D. If a service station is built halfway between the rest areas, what are the coordinates of the point representing the service station?

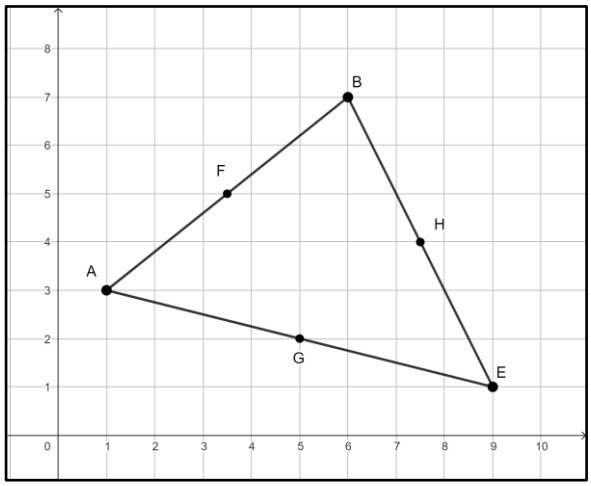
    A. $(0,3.5)$
    B. $(-2,0.5)$
    C. $(-2.5,0.5)$
    D. $(-4,-2.5)$

Coordinate Geometry

17. Segment XY has endpoints at $X(-2, 7)$ and $Y(3, 1)$. What is the length of $\overline{XY}$? Enter your answer in the box below.

18. Segment PQ has endpoints at $P(-5, 5)$ and $Q(2.5, -2.5)$. What is the length of $\overline{PQ}$? Enter your answer in the box below.

19. Triangle ABE is shown below. Select All the true statements.



A. Point H is the midpoint of $\overline{BE}$.

B. Point F is the midpoint of $\overline{AB}$.

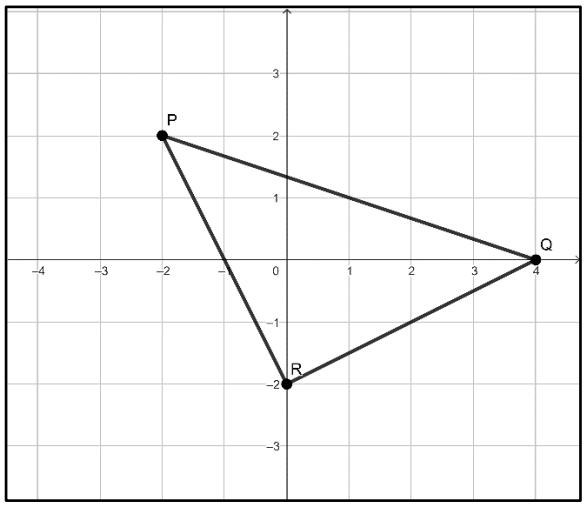
C. $FH = 4.1$

D. $AB = 2GH$

E. $\overline{BG}$ is the perpendicular bisector of $\overline{AE}$.

F. The medians of triangle ABE intersect at point $(5.3, 3.7)$

20. Triangle PQR is shown below. Select All the true statements.



A. $\overline{PR} \cong \overline{PQ}$

B. $\overline{PR} \cong \overline{RQ}$

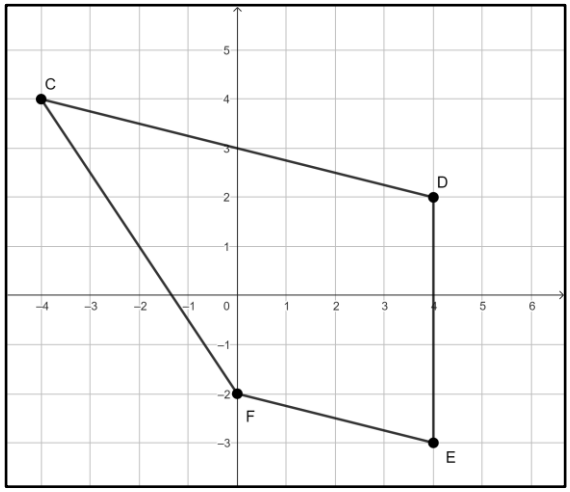
C. $\overline{PR} \perp \overline{RQ}$

D. Triangle PQR is a right triangle.

E. Triangle PQR is an isosceles triangle.

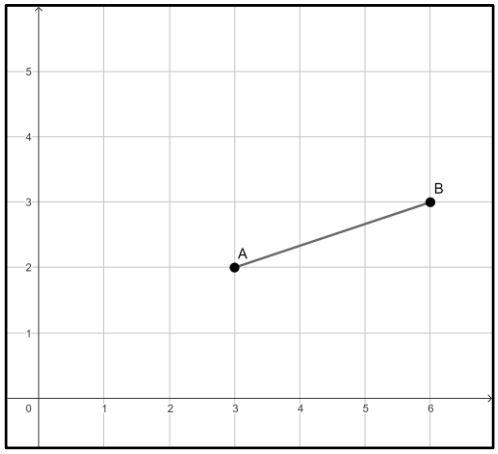
Coordinate Geometry

21. Given quadrilateral $CDEF$ shown below. Which of the following statements are true? Select All that apply.



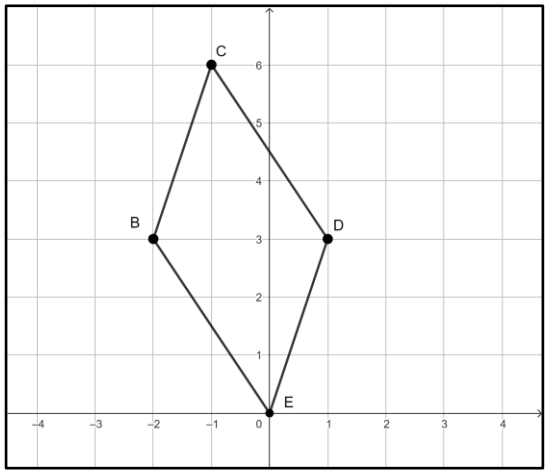
A. $CF = \sqrt{52}$
B. $DE = 5$
C. $CF = CD$
D. The slope of $\overline{FE}$ is $-\frac{1}{4}$.
E. The slope of $\overline{CD}$ is $-\frac{1}{4}$.
F. Quadrilateral $CDEF$ is a trapezoid.

22. Consider line segment AB shown below. Which of the following locations for point C makes triangle ABC an isosceles triangle?



A. $(3, 5)$
B. $(4, 5)$
C. $(5, 3)$
D. $(5, 4)$

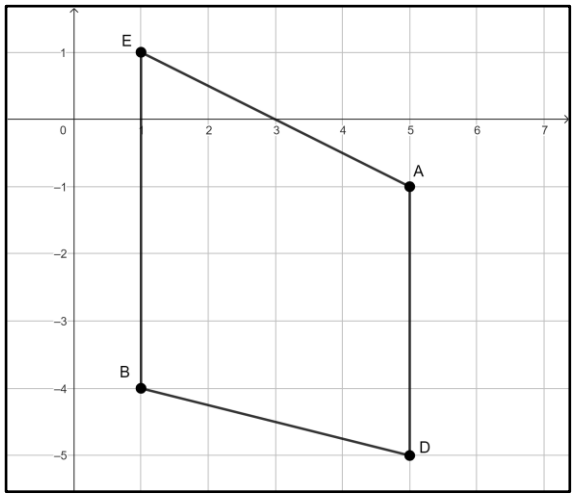
23. Quadrilateral $BCDE$ is shown below. Select All the true statements.



A. $\overline{BC} \cong \overline{CD}$
B. $\overline{BE} \cong \overline{CD}$
C. $\overline{CE} \cong \overline{BD}$
D. $(-0.5, 3)$ is the midpoint of $\overline{CE}$.
E. $(-0.5, 3)$ is the midpoint of $\overline{BD}$.
F. $BCDE$ is a parallelogram.
G. $BCDE$ is a rhombus.

Coordinate Geometry

24. Quadrilateral $BEAD$ is shown below. Select All the true statements.



A. $\overline{EA} \cong \overline{BD}$

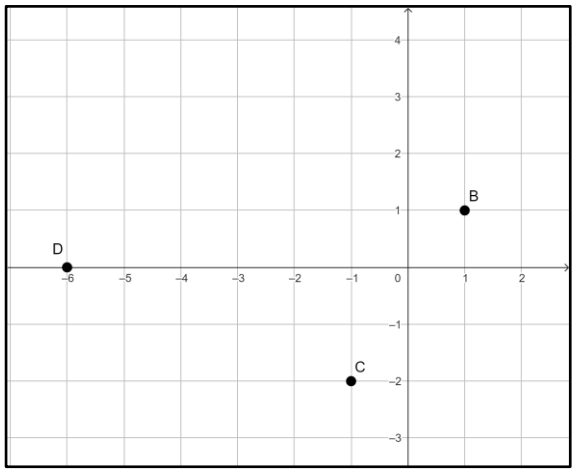
B. $\overline{BE} \parallel \overline{DA}$

C. $\overline{EA} \parallel \overline{BD}$

D. Quadrilateral $BEAD$ is a trapezoid.

E. Quadrilateral $BEAD$ is a parallelogram.

25. The vertices of quadrilateral $ABCD$ are $B(1,1)$, $C(-1,-2)$, and $D(-6,0)$, as shown below. For $ABCD$ to be a parallelogram, what must the coordinates of point A?



A. $A(-3,3)$

B. $A(-3,4)$

C. $A(-4,3)$

D. $A(-4,4)$

26. The ordered pairs that describe the locations of three vertices of a parallelogram on a coordinate plane are given.

$$(-5,5)\ (-4,8)\ (-2,2)$$

Which ordered pair describes a possible location of the fourth vertex of the parallelogram?

A. $(-3,-1)$

B. $(-3,0)$

C. $(-4,1)$

D. $(-4,2)$

27. Given $PQRS$ with $P(3,1)$, $Q(8,1)$, $R(10,4)$, $S(5,4)$. If the diagonals intersect at point T, what are the coordinates of T?

Coordinate Geometry

28. If $ABCD$ is a square with diagonals $B(2, 9)$ and $D(-11, -4)$, what are the coordinates of the other diagonal?

    A. $A(-11, -9)$ and $C(-2, 4)$
    B. $A(-11, 9)$ and $C(2, -4)$
    C. $A(-11, -4)$ and $C(-2, 4)$
    D. $A(11, 4)$ and $C(2, -4)$

29. Quadrilateral $ABCD$ has vertices $A(-5, 7)$, $B(-3, 6)$, and $C(-6, 0)$. Which point would make $ABCD$ a rectangle?

    A. $D(-4, -1)$
    B. $D(-7, 2)$
    C. $D(-8, 2)$
    D. $D(-8, 1)$

30. What are the coordinates of the centroid of ΔCAT with vertices $C(-3, 1)$, $A(-2, 4)$, and $T(5, -2)$?

    A. $\left(\frac{5}{2}, -\frac{1}{2}\right)$
    B. $\left(\frac{5}{4}, \frac{3}{2}\right)$
    C. $(0, 1)$
    D. $\left(\frac{3}{4}, 1\right)$

31. Quadrilateral $STAR$ has vertices $S(3, 5)$, $T(7, 8)$, $A(13, 5)$, and $R(13, 0)$. Which statements are true? Select All that apply.

    A. $\overline{TA} \cong \overline{SR}$
    B. $\overline{ST} \cong \overline{AR}$
    C. $\overline{TA} \parallel \overline{SR}$
    D. $\overline{ST} \parallel \overline{AR}$
    E. Quadrilateral $STAR$ is a trapezoid.
    F. Quadrilateral $STAR$ is an isosceles trapezoid.

32. Quadrilateral $TASK$ has vertices $T(1, -1)$, $A(1, 2)$, $S(3, 2)$, and $K(3, -1)$. Which of the following statements are true? Select All that apply.

    A. $\overline{AS} \cong \overline{TK}$
    B. $\overline{TS} \cong \overline{AK}$
    C. $\overline{AS} \parallel \overline{TK}$
    D. $\overline{TA} \perp \overline{AS}$
    E. $\overline{TS} \perp \overline{AK}$
    F. Quadrilateral $TASK$ is a rectangle.
    G. Quadrilateral $TASK$ is a rhombus.

Coordinate Geometry

33. Quadrilateral $TEAM$ has vertices $T(2,6)$, $E(3,8)$, $A(4,6)$, and$M(3,4)$. Which of the following statements are true? Select All that apply.

    A. $\overline{TE} \cong \overline{EA}$
    B. $\overline{TA} \cong \overline{EM}$
    C. $\overline{AM} \parallel \overline{ET}$
    D. $\overline{TA} \perp \overline{EM}$
    E. $\overline{TE} \perp \overline{EA}$
    F. Quadrilateral $TASK$ is a rhombus.

34. Which type of triangle has vertices at the points $R(2,1)$, $S(2,5)$, and $T(4,1)$?

    A. Right
    B. Acute
    C. Isosceles
    D. Equilateral

35. Which type of triangle has vertices at the points $A(-3,0)$, $B(-1,2)$, and $C(0,-1)$?

    A. Right
    B. Obtuse
    C. Isosceles
    D. Equilateral

36. The coordinates of each vertex of quadrilateral $LMNP$ are listed.
    - $L(x,y)$
    - $M(2x,-y)$
    - $N(-2x,-y)$
    - $P(-x,y)$

    In quadrilateral $LMNP$, $x = y$, and $x \neq 0$. What type of quadrilateral is $LMNP$?

    A. Square
    B. Rhombus
    C. Trapezoid
    D. Rectangle

37. Quadrilateral $LMNO$ has vertices $L(-3,2)$, $M(2,1)$, $N(3,-4)$, and $O(-2,-3)$. Which statements about quadrilateral $LMNO$ ae true? Select Two that apply.

    A. Quadrilateral $LMNO$ is a kite.
    B. Quadrilateral $LMNO$ is a parallelogram.
    C. Quadrilateral $LMNO$ is a rectangle.
    D. Quadrilateral $LMNO$ is a rhombus.
    E. Quadrilateral $LMNO$ is a square.

Coordinate Geometry

38. Quadrilateral $EFGH$ has vertices $E(-0.5, -1)$, $F(-1, 1)$, $G(1, 1.5)$, and $H(1.5, -0.5)$. Which statements about quadrilateral $LMNO$ ae true? Select All that apply.

    A. Quadrilateral $EFGH$ is a kite.
    B. Quadrilateral $EFGH$ is a parallelogram.
    C. Quadrilateral $EFGH$ is a rectangle.
    D. Quadrilateral $EFGH$ is a rhombus.
    E. Quadrilateral $EFGH$ is a square.

39. Imani draws triangle PQR with vertices $P(1, 1)$, $Q(-2, 4)$, and $R(1, 7)$. She claims that the triangle is an isosceles right triangle.

    Which statement shows that Imani is correct?

    A. The slope of $\overline{PQ}$ is 1, which is the reciprocal of the slope of $\overline{QR}$, and PQ and QR are equal to $\sqrt{6}$.
    B. The slope of $\overline{PQ}$ is 1, which is the reciprocal of the slope of $\overline{QR}$, and PQ and QR are equal to $3\sqrt{2}$.
    C. The slope of $\overline{PQ}$ is -1, which is the negative reciprocal of the slope of $\overline{QR}$, and PQ and QR are equal to $\sqrt{6}$.
    D. The slope of $\overline{PQ}$ is -1, which is the negative reciprocal of the slope of $\overline{QR}$, and PQ and QR are equal to $3\sqrt{2}$.

40. A rhombus is drawn in the standard xy-coordinate plane. The line $2x + y = 4$ includes one of the rhombus' diagonals. What is the slope of the other diagonal? Enter your answer in the box below.

41. Line segment XY has endpoints $X(5, 7)$ and $Y(-3, 3)$. Find the equation for the perpendicular bisector of line segment XY.

    A. $x - 2y = -9$
    B. $2x + y = 7$
    C. $x + 2y = 11$
    D. $2x - y = -3$

42. Circle O is centered at the origin. Point $D(-2, -3.5)$ lies on the circle. What is the approximate length of the radius of the circle?

    A. 2
    B. 3.5
    C. 4
    D. 5.5

Coordinate Geometry

43. Point $A(0, 4)$ is located on circle C. The center of circle C is $(-4,\ 2)$. What is the length of the diameter of the circle?

A. $2\sqrt{5}$

B. $4\sqrt{5}$

C. $2\sqrt{13}$

D. $4\sqrt{13}$

44. The center of a circle is $(5\ ,-3)$ and its radius is 4. Which point lies outside of the circle?

A. $(4\ ,-2)$

B. $(6\ ,0)$

C. $(4\ ,-5)$

D. $(-1\ ,-4)$

45. Which of these points lies on the circle that is centered at $(3, 0)$ and passes through the point $(3, 2)$?

A. $(0, 1)$

B. $(1, 2)$

C. $\left(2, \sqrt{3}\right)$

D. $\left(4, -\sqrt{2}\right)$

46. A circle drawn on a coordinate plane has center $(-1, 2)$ and contains the point $(-1, 0)$. Hanorah wants to prove that the point $(-2, 3.7)$ lies on the circle. Which of the following steps could Hanorah take? Select All that apply.

A. Show that $(-1, 2)$ and $(-1, 0)$ are at the same distance from the point $(-2, 3.7)$.

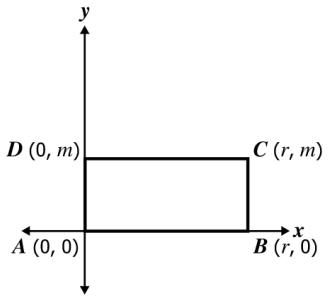
B. Show that $(-2, 3.7)$ and $(-1, 0)$ are the same distance from the point $(-1, 2)$.

C. Determine the equation of the circle and show that $(-2, 3.7)$ satisfies this equation.

D. Determine the distance between $(-1, 0)$ and $(-2, 3.7)$ and show that is the radius.

E. Determine the distance between $(-1, 2)$ and $(-2, 3.7)$ and show that it is twice the radius.

47. Given: Quadrilateral ABCD.



Which expression proves that $ABCD$ is a rectangle?

A. The length of each diagonal is $\sqrt{r^2 + m^2}$.

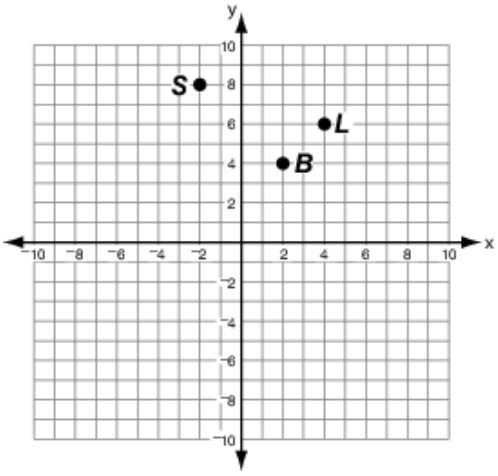
B. The common midpoint of the diagonals is $\left(\frac{r}{2}, \frac{m}{2}\right)$.

C. The slope of $\overline{AC}$ is $\frac{m}{r}$ and the slope of $\overline{BD}$ is $\frac{-m}{r}$.

D. The length of both $\overline{AB}$ and $\overline{CD}$ is r and the length of both $\overline{AD}$ and $\overline{BC}$ is m.

Coordinate Geometry

48. Jessie plotted different locations in her school on the coordinate grid below. She represented the school entrance at point S, the basketball court at point B, and the library at point L.



Part A: If a walkway is built to join the school entrance, the basketball court, and the library, what type of triangle is formed?

A. Right isosceles triangle

B. Obtuse isosceles triangle

C. Right scalene triangle

D. Obtuse scalene triangle

Part B: Jessie's school plans to build a swimming pool centered at point P in such a way that $SBLP$ forms a rectangle. What could be the coordinates of the swimming pool?

A. $(0, 9)$

B. $(0, 10)$

C. $(1, 10)$

D. $(1, 9)$

Part C: Jessie's entire school campus is in the shape of a circle. The center of the school campus is located at $(1, 2)$ and the campus boundary passes through $(-2, 8)$. If the coordinates of the swimming pool in part B represent the center of the pool, is it possible to build a swimming pool inside the campus boundaries with the specifications given in part B?

A. Yes, because the center of the swimming pool lies inside the circle representing the boundary of the school campus.

B. Yes, because the center of the swimming pool lies on the circle representing the boundary of the school campus.

C. No, because the center of the swimming pool lies on the circle representing the boundary of the school campus.

D. No, because the center of the swimming pool lies outside the circle representing the boundary of the school campus.

49. Isosceles triangle JKL has a perimeter of 32 units and the given vertices.

- $J\ (-3, -9)$
- $K\ (-3, 6)$
- $L\ (x, -1.5)$

What is the possible x-coordinate for point L?

A. -18.2

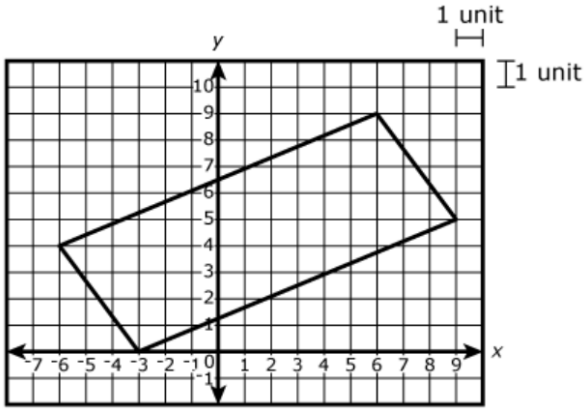
B. -7

C. 3

D. 12.3

Coordinate Geometry

50. A parallelogram is shown on this coordinate plane.



What is the perimeter, in units, of the parallelogram?

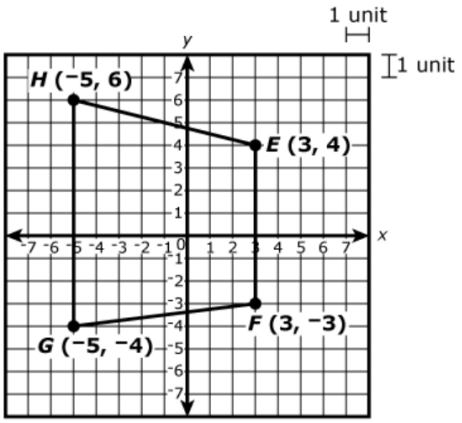
A. 24

B. 36

C. 48

D. 64

51. Trapezoid $EFGH$ is shown on this coordinate plane.



Which of the following is closest to the perimeter of the trapezoid?

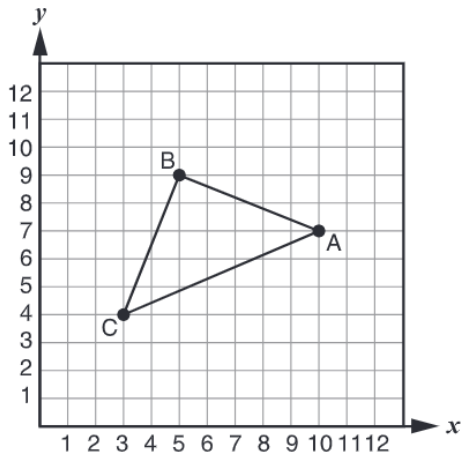
A. 30.0 units

B. 32.7 units

C. 33.3 units

D. 36.0 units

52. In ΔABC, $\angle B$ is a right angle. Rounded to the nearest tenth, what is the area, in square units, of ΔABC?



A. 12.5

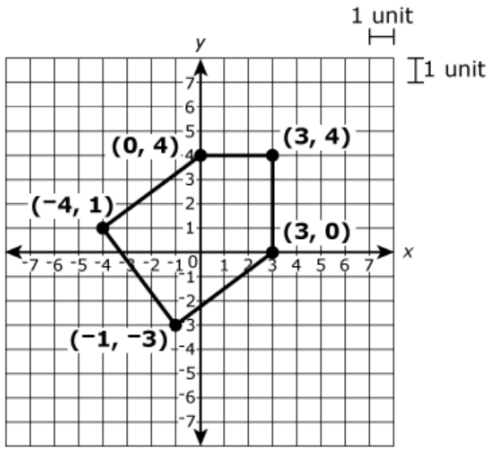
B. 14.5

C. 25

D. 29

Coordinate Geometry

53. A pentagon is graphed on this coordinate plane.



Part A: What is the perimeter, in units, of the pentagon?

A. 17.8 units

B. 22 units

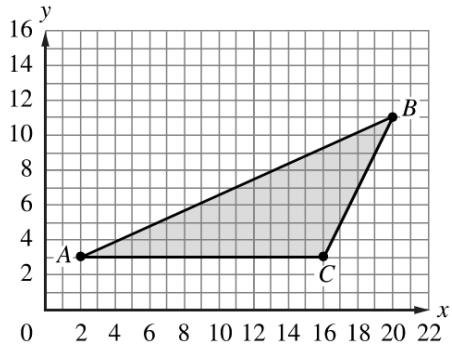
C. 23.2 units

D. 27 units

Part B: What is the area, in square units, of the pentagon? Enter your answer in the box.

square units

54. Triangle ABC is shown in the following xy −plane with $A(2, 3)$, $B(20, 11)$, and $C(16, 3)$.

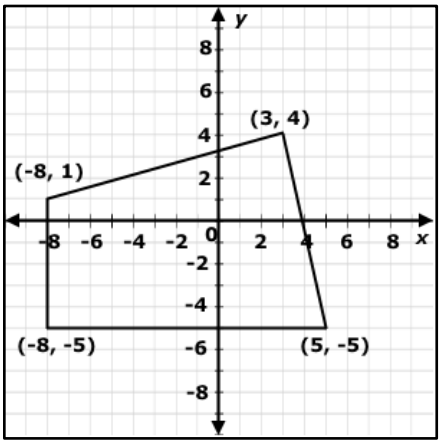


What is the area, in square units, of ΔABC?

Enter your answer in the box.

square units

55. Tami is looking to enclose a dog pen with a fence. The pen is shaped like a quadrilateral and is modeled on the coordinate plane below, where each unit represents one foot. What is the perimeter of the quadrilateral, rounded to the nearest foot?



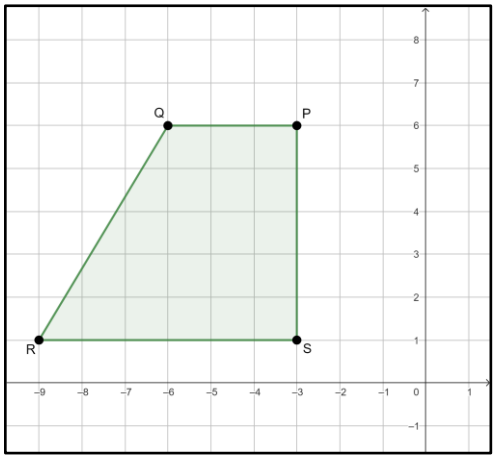
What is the perimeter of the quadrilateral, rounded to the nearest foot?

Enter your answer in the box.

ft

Coordinate Geometry

56. Mrs. Kennsington oversees designing the plans for the new community garden being built in her town. She designs the garden in the shape of a trapezoid and plots her plans on a coordinate grid with vertices at $P(-3, 6)$, $Q(-6, 6)$, $R(-9, 1)$, and $S(-3, 1)$.



Part A. If each unit on the grid represents 1 foot, how many feet of fencing are required to put a fence around the garden? Round your answer to the nearest hundredth of a foot.

Enter your answer in the box.

ft

Part B. What is the area of the community garden?

ft^2

57. Rosa is building a flowerbed for her mom in the shape of a parallelogram. When drawn in the coordinate plane, the flowerbed has vertices at $(-4, 0)$, $(-2, 6)$, $(4, 0)$, and $(2, -6)$.

Part A: If every unit represents a foot, what is the area of the flowerbed?

A. $24\ ft^2$

B. $36\ ft^2$

C. $48\ ft^2$

D. $64\ ft^2$

Part B: If the plant tag recommends that for 6 inches spacing you need 4 plants per square foot, how many plants do you need to cover the flowerbed?

A. 8 plants

B. 12 plants

C. 192 plants

D. 288 plants