TEST NAME: **Math 1 Geometry Test**
TEST ID: **2093248**
GRADE: **09 - Ninth Grade**
SUBJECT: **Mathematics**
TEST CATEGORY: **My Classroom**

1. A city map is placed on a coordinate grid. Jane's house is located at (9, ⁻1) and Bob's house at (3, ⁻7). Melvin's house is halfway between Jane's house and Bob's house. What are the coordinates of Melvin's house?

   A. (3, 3)

   B. (4, ⁻2)

   C. (6, ⁻4)

   D. (15, 5)

2. A circle has a diameter that extends from (4, ⁻6) to (⁻8, 10). What are the coordinates of the center of the circle?

   A. (⁻2, 2)

   B. (⁻3, 6)

   C. (⁻4, 4)

   D. (⁻6, 8)

3. A baseball team hosts an exhibition game in order to raise at least $5,000 for new equipment. Regular stadium seats sell for $5 each, but each of the 400 premium seats sells for $10.

   The coach draws up a feasible region in the coordinate plane, where x represents the number of premium seats the game sells, and y represents the number of regular seats the game sells. Which of the following inequalities is NOT a boundary condition for the feasible region?

   A. $10x + 5y \geq 5000$

   B. $x + y \geq 5000$

   C. $x \leq 400$

   D. $x \geq 0$

4. The vertices of a quadrilateral are located at (⁻3, 4), (2, 7), (5, 2), and (0, ⁻1). Which **best** describes the quadrilateral?

    A. parallelogram

    B. rectangle

    C. rhombus

    D. square

5. Which is an equation of a line that is parallel to the line that passes through the point (⁻2, 3) and (0, 2)?

    A. $y = ^-\frac{1}{2}x + 2$

    B. $y = \frac{1}{2}x + 1$

    C. $y = x + 3$

    D. $y = 2x - 4$

6. **A top view of a natural trail is shown on the grid below.**

Top View of Nature Trail
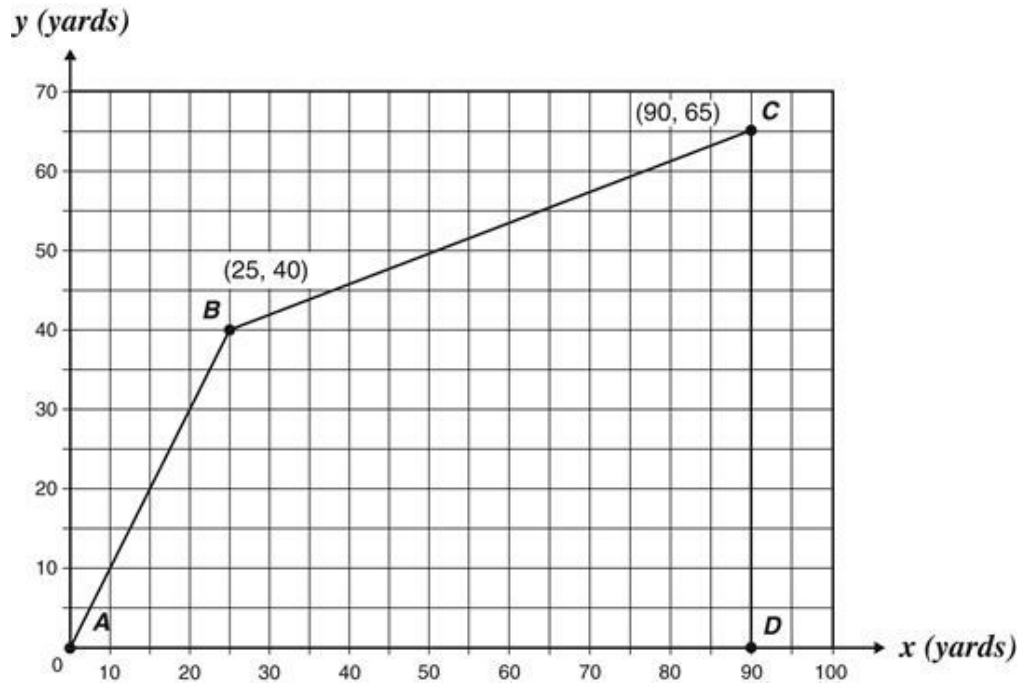
- There is a water station at the midpoint of Determine the coordinates of the water station and write them on the map. In the space below, show work to support your answer.

- Determine the lengths of and Show all work necessary to support your answer.

- Joe follows the nature trail from *A* to *B*, *B* to *C*, *C* to *D*, and then back to *A*. Determine whether Point *C* is before or after the half-way point in his journey. Show work or write an explanation to support your answer.

7. What is the slope of a line that is parallel to the graph of $y = \frac{1}{4}x - 3$?

A. $^-4$

B. $-\frac{1}{4}$

C. $\frac{1}{4}$

D. 4

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8. △*EFG* is a right triangle. The measure of ∠*G* is 90°. Vertices *F* and *G* are located at *F*(⁻1, ⁻1) and *G*(2, 3). What is the slope of $\overline{EG}$?

   A. $\dfrac{4}{3}$

   B. $-\dfrac{4}{3}$

   C. $\dfrac{3}{4}$

   D. $-\dfrac{3}{4}$

9. A circle is centered at (3, ⁻1). Line segment *PQ* is a diameter of the circle. Point *P* is located at (6, 3). What are the coordinates of point *Q*?

   A. (⁻3, ⁻4)

   B. (0, ⁻5)

   C. (4.5, 1)

   D. (9, 2)

10. Which coordinate represents the midpoint between (⁻6, ⁻*k*) and (2, *k*)?

   A. (⁻2, 0)

   B. (⁻4, 0)

   C. (⁻4, ⁻*k*)

   D. (⁻8, ⁻2*k*)

11. Line *k* passes through points (4, 3) and (8, 2). What is the slope of a line perpendicular to line *k*?

   A. ⁻4

   B. $-\dfrac{1}{4}$

   C. $\dfrac{1}{4}$

   D. 4

12. A rail line is mapped on a coordinate grid with station A at $A(12, 14)$ and station B at $B(-10, -8)$. A train leaves station A at the same time another train leaves station B on a parallel track. The train leaving station A is traveling at 30 miles per hour, and the train leaving station B is traveling at 25 miles per hour. If the trains are traveling toward each other at a constant speed, what are the coordinates of the location at which the trains will pass each other?

   A. $(0, 2)$

   B. $(1, 3)$

   C. $(2, 4)$

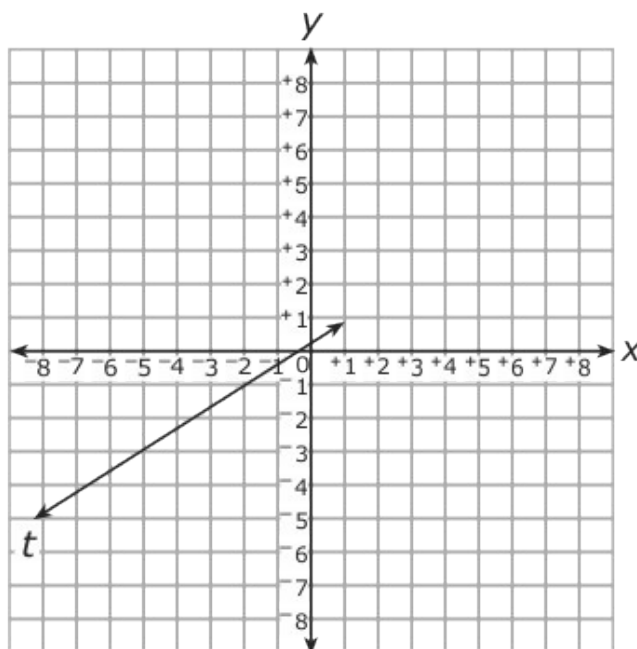   D. $(3, 5)$

13. Which equation is parallel to a line that passes through the points (4, ⁻5) and (2, 6)?

   A. $y = \frac{2}{11}x + 15$

   B. $y = \frac{-2}{11}x - 17$

   C. $y = \frac{-11}{2}x + 15$

   D. $y = \frac{11}{2}x + 17$

14. **What is the midpoint of the line segment that contains (−2, 3) and (1, −4)?**

   A. $\left(-\frac{5}{2}, \frac{5}{2}\right)$

   B. $\left(-\frac{3}{2}, \frac{7}{2}\right)$

   C. $\left(-\frac{1}{2}, -\frac{1}{2}\right)$

   D. $\left(\frac{1}{2}, -\frac{3}{2}\right)$

15. Which is an equation of a line that is perpendicular to line t on the graph below?


A. $2x - 3y = {}^-9$

B. $3x + 2y = 18$

C. $2x + 3y = 21$

D. $3x - 2y = {}^-2$

16. Andrew drew parallelogram *PQRS* on a coordinate plane with vertices at $P(x_1, y_1), Q(x_2, y_2), R(x_3, y_3),$ and $S(x_4, y_4).$ Which set of assertions is sufficient to prove that *PQRS* is a square?

A. $\sqrt{(x_4+x_1)^2+(y_4+y_1)^2} = \sqrt{(x_2+x_1)^2+(y_2+y_1)^2}$ and $\dfrac{y_2-y_1}{x_2-x_1} = \dfrac{x_4-x_1}{y_1-y_4}$

B. $\sqrt{(x_4-x_1)^2+(y_4-y_1)^2} = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$ and $\dfrac{y_2-y_1}{x_2-x_1} = \dfrac{y_4-y_1}{x_4-x_1}$

C. $\sqrt{(x_4+x_1)^2+(y_4+y_1)^2} = \sqrt{(x_2+x_1)^2+(y_2+y_1)^2}$ and $\dfrac{y_2-y_1}{x_2-x_1} = \dfrac{y_4-y_1}{x_4-x_1}$

D. $\sqrt{(x_4-x_1)^2+(y_4-y_1)^2} = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$ and $\dfrac{y_2-y_1}{x_2-x_1} = \dfrac{x_4-x_1}{y_1-y_4}$

17. What **best** describes the shape of the figure that has vertices at (⁻1, ⁻3), (⁻5, ⁻6), (3, ⁻12), and (7, ⁻9)?

   A. parallelogram

   B. rectangle

   C. rhombus

   D. square

18. The center of a circle is at $Q(0, 6)$. A radius is drawn from Q to $P(4, 6)$. What are the coordinates of the endpoint of the diameter that includes segment PQ?

   A. (0, 2)

   B. (0, 10)

   C. (⁻4, 6)

   D. (6, ⁻4)

19. The graph of $ax + 5y = 9$ is perpendicular to the graph of $5x + y = ⁻8$. What is the value of a?

   A. ⁻1

   B. $-\dfrac{1}{5}$

   C. 1

   D. 5

20. Triangle *XYZ* is shown on the graph below.
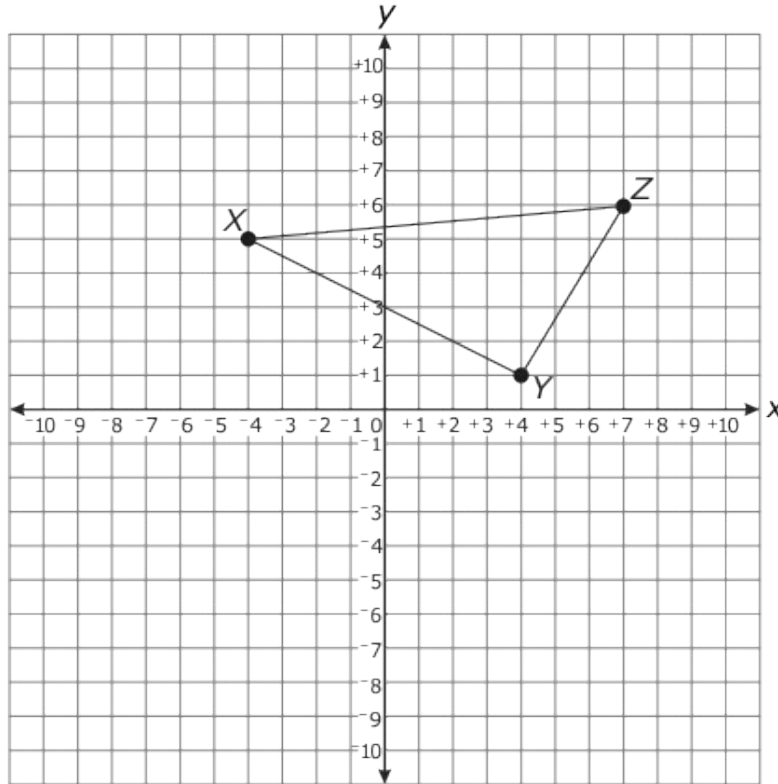
What is the *approximate* area of triangle *XYZ*?

A. 20 units^2

B. 26 units^2

C. 40 units^2

D. 52 units^2

21. What is the *approximate* perimeter of a quadrilateral with vertices (2, 5), (5, 4), (4, ⁻4), and (⁻1, ⁻2)?

A. 12.7 units

B. 21.6 units

C. 24.3 units

D. 26.3 units

22. A straight road is to be built between the two cities. There will be a rest stop placed halfway between the cities. When placed on a coordinate grid, the rest stop is located at (3, 8). Which points could represent the location of the 2 cities?

   A. (17, 14) and (14, 6)

   B. (1, 5) and (5, 13)

   C. (⁻5, ⁻4) and (11, 20)

   D. (⁻6, ⁻8) and (⁻3, 0)

23. Triangle *PQR* has vertices located at (2, 2), (5, ⁻4), and (⁻4, ⁻1). What type of triangle is triangle *PQR*?

   A. equilateral

   B. isosceles

   C. obtuse

   D. scalene

24. What are the coordinates of the midpoint of the line segment with endpoints at (4.5, 7.5) and (9, 12)?

   A. (6.5, 9.5)

   B. (6.75, 9.75)

   C. (7.75, 10.75)

   D. (13.5, 19.5)

25. Andy is studying a quadrilateral with the vertices $A(6, 1), B(8, 2), C(9, 4)$, and $D(7, 3)$. Which statement explains how Andy could prove what kind of quadrilateral this is?

   A. find the slopes of the pairs of opposite sides to show that the figure is a parallelogram

   B. find the slopes of the pairs of opposite sides to show that the quadrilateral is a rectangle

   C. find the lengths of the diagonals to show that the quadrilateral is a parallelogram

   D. find the lengths of the diagonals to show that the quadrilateral is a rectangle

26. Which is an equation of the line that passes through the point (2, 0) and is parallel to the graph of $y = {}^{-}4x + 1$?

A.
$$y = {}^{-}4x + 2$$

B.
$$y = {}^{-}4x + 8$$

C.
$$y = \frac{1}{4}x - \frac{1}{2}$$

D.
$$y = \frac{1}{4}x + \frac{1}{2}$$

27. Ashley is buying a border for her flowerbed. She makes a graphed model of the border in which 1 unit equals 1 foot. The vertices of her flowerbed are $({}^{-}4, 2)$, $({}^{-}6, 7)$, $(0, 11)$, $(4, 9)$, and $(4, 2)$. Each foot of border costs $1.09. **About** how much will Ashley spend on the border?

A. $29

B. $32

C. $33

D. $35

28. 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 $C(15, 16.5)$

29. A triangle has the vertices $X(3, 1)$, $Y(6, 2)$, and $Z(4, 3)$. Which statement is true?

A. Angle X is a right angle.

B. Angle Y is a right angle.

C. Angle Z is a right angle.

D. None of the angles is a right angle.

30. The endpoints of a line segment are located at (3, 6) and (4, ⁻5). What are the coordinates of the midpoint of the line segment?

   A. $\left(\frac{7}{2}, \frac{1}{2}\right)$

   B. $\left(\frac{1}{2}, \frac{^-11}{2}\right)$

   C. $\left(\frac{9}{2}, \frac{^-1}{2}\right)$

   D. $(7, 1)$

31. Which **best** describes the quadrilateral with vertices at (7, 8), (9, 10), (7, 12), and (5, 10)?

   A. non-square rectangle

   B. non-square rhombus

   C. square

   D. trapezoid

32. Four friends plotted the locations of their houses on a coordinate plane.

   - Sarah's house is located at (7, ⁻2).
   - Mandy's house is located at (3, 5).
   - Cameron's house is exactly halfway between Sarah's house and Mandy's house.
   - Kayla's house is exactly halfway between Cameron's house and Mandy's house.

   What are the coordinates of Kayla's house?

   A. $\left(2, \frac{^-7}{2}\right)$

   B. $\left(4, \frac{13}{4}\right)$

   C. $\left(5, \frac{3}{2}\right)$

   D. $\left(6, \frac{^-1}{4}\right)$

33. The vertices of a triangle are located at (0, 0), (5, 12), and (10, 0). What is the perimeter of this triangle?

    A. 26 units

    B. 30 units

    C. 36 units

    D. 60 units

34. Line segment *JK* has endpoints at *J*($^-$3, 4) and *K*(3, 6). Which is an equation of a line that is perpendicular to line segment *JK* and passes through the point (3, $^-$12)?

    A. $y = \frac{1}{3}x - 13$

    B. $y = \frac{1}{3}x - 11$

    C. $y = {}^-3x - 21$

    D. $y = {}^-3x - 3$

35. What is the **approximate** perimeter of a triangle that has vertices at ($^-$1, $^-$9), (6, $^-$3), and ($^-$3, 5)?

    A. 37.0 units

    B. 35.4 units

    C. 25.1 units

    D. 22.3 units

36. A circle has a center point at ($^-$8, $^-$7). Line segment *EF* is a diameter of the circle. Point *F* is located at ($^-$2, $^-$12). What are the coordinates of point *E*?

    A. ($^-$14, $^-$2)

    B. ($^-$10, $^-$19)

    C. ($^-$5, $^-$10)

    D. (4, $^-$17)

37. The map below shows the course of a charity walk placed upon a coordinate grid.
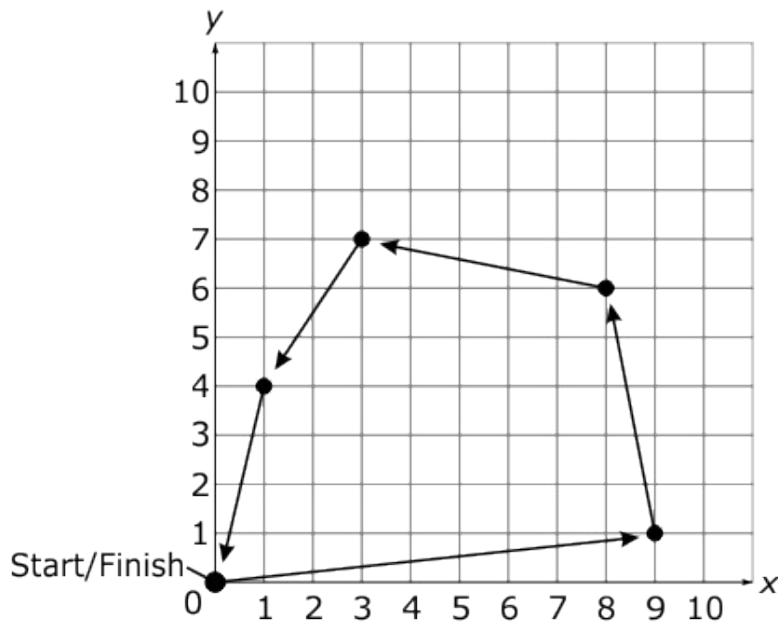
If the scale is 1 unit = 0.1 mile, what is the **approximate** total distance of the course?

A. 27 miles

B. 23 miles

C. 2.7 miles

D. 2.3 miles

38. A figure has vertices at (2, 5), (4, 3), (5, 4), and (3, 6). Which most precisely describes the figure?

A. parallelogram

B. rectangle

C. rhombus

D. square

39. Jason marks two points, $A(4, 6)$ and $B(8, 2)$, on a coordinate grid. He then marks point C on $\overline{AB}$.

- If point C divides $\overline{AB}$ in the ratio $\overline{AC}:\overline{CB} = 1:3$, what are the coordinates of point C?
- Jason wants to check to be sure he calculated the location of point C correctly. Show one way he could do this.

Use words, numbers and/or pictures to show your work.

40. The students of Lincoln High School are raising money to support the sports teams. A local organization donated boxes of popcorn and candy for the students to sell. The freshmen are selling boxes of popcorn for $2 each, and the sophomores are selling boxes of candy for $4 each. The students' target is to raise **more than** $800. The sophomores expect to sell **at most** 100 boxes of candy. Let x represent the number of boxes of popcorn sold and y represent the number of boxes of candy sold. Which system of inequalities models the given situation?

A. $\begin{cases} y < 100 \\ 2x + 4y > 800 \end{cases}$

B. $\begin{cases} y \le 100 \\ 2x + 4y > 800 \end{cases}$

C. $\begin{cases} y < 100 \\ 4x + 2y > 800 \end{cases}$

D. $\begin{cases} y \le 100 \\ 4x + 2y > 800 \end{cases}$