TEST NAME: **GPE.7**

TEST ID: **464126**

GRADE: **09**

SUBJECT: **Mathematics**

TEST CATEGORY: **My Classroom**

Student: _____

Class: _____

Date: _____

Read the passage - 'College Apartments' - and answer the question below:

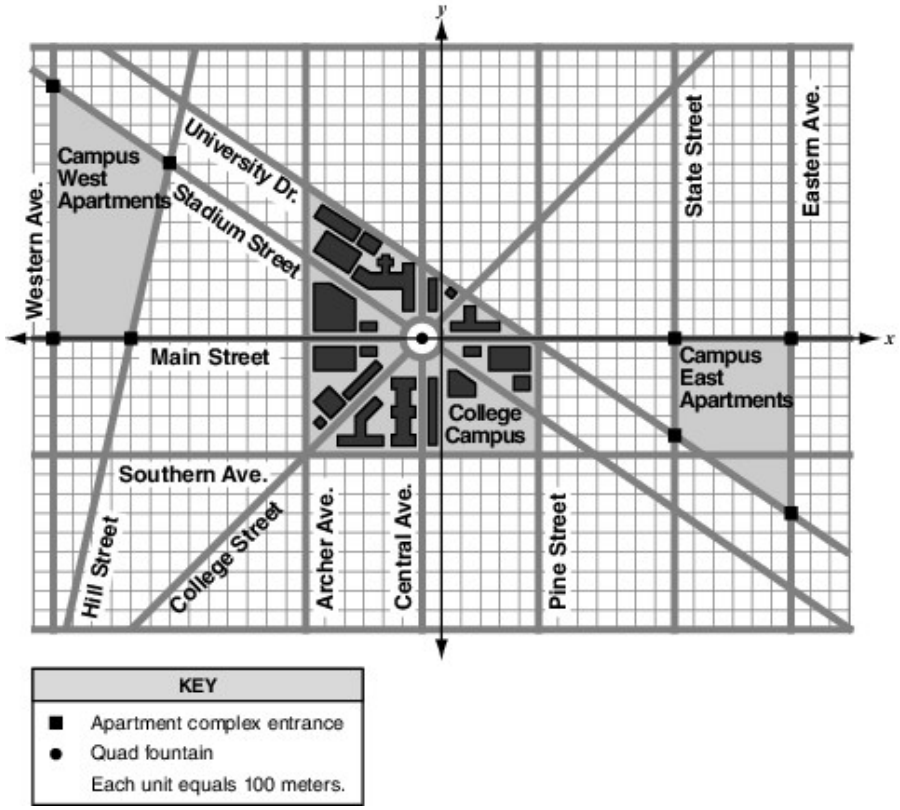
College Apartments

College Apartments

The number of students enrolled in a local college is increasing rapidly, and there is limited space in the high-rise residence halls on the college campus. Because of this, more students are moving to apartments near campus. The college is working with a real estate development company to plan two new apartment complexes to provide housing for the additional students.

The college has requested that each apartment complex have housing for at least 300 students, as well as such amenities as laundry and common study areas, so that it provides a similar environment to that of the residence halls. Each of the residence halls on campus is 11 stories tall; 10 floors each contain 32 one-bedroom dormitories, and 1 floor contains a study lounge, cafeteria, social area, and laundry room.

As shown in the map of the area near the college campus below, one new apartment complex will be to the west of campus and one will be to the east. The new developments are titled Campus West Apartments and Campus East Apartments, respectively.



Michael and Nancy work for the development company, and they are each managing the teams that are designing these two apartment complexes. They both want to create apartments that meet the college's requirements and that students want to live in.

Michael's team is developing a plan for an apartment complex where students will live in 2 large three-story apartment buildings. One building will have 20 two-bedroom apartments on each floor, and the other building will have 16 four-bedroom apartments on each floor. There will also be a separate, smaller building that contains the management office, a common area with a food court, a study center, and a laundry facility. Michael is also planning to put picnic tables outside so students can have an additional area in which to socialize, and students will have the option of getting a parking space in the apartment complex's parking lot.

Instead of a few large apartment buildings, Nancy's team has decided that many smaller apartment buildings will make the apartment complex feel more welcoming. This development will be made up of 15 four-story apartments that each have 2 three-bedroom apartments on each floor. Laundry will be included in each apartment. In this complex, there will also be two smaller buildings that serve as common areas. These buildings will include computer labs, pool tables, and a mini-market. There will not be a parking lot, but there will be an outdoor basketball court and a sand volleyball court.

Students on campus are eager to secure apartments and roommates for next year and are comparing their options to determine which development is best for their needs.

1. Read "College Apartments" and answer the questions.

   Part A. Find the area of the Campus East Apartment complex.

   Part B. Find the area of the Campus West Apartment complex. Explain how you divided the complex into shapes you knew how to find the area of.

   Part C. The footprint of each of the smaller apartment buildings Nancy is designing is 100 meters by 150 meters. The footprints of Michael's buildings are both 620 meters long by 120 meters wide. Based on this information and the information in the passage, which apartment complex should have Nancy's smaller apartments and which apartment complex should have Michael's apartment buildings? Use calculations and information from the passage to defend your answer.

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

2. 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

3. A rectangle drawn on the coordinate plane has vertices at $(4, 4), (1, 8), (-7, 2)$, and $(-4, -2)$. What is the area, in square units, of the rectangle?

   A. 24

   B. 30

   C. 44

   D. 50

4. What is the ***approximate*** perimeter of a triangle with vertices at (1, 3), ($^{-}$4, 1), and ($^{-}$3, 5)?

   A. 4.5 units

   B. 12.0 units

   C. 14.0 units

   D. 22.4 units

5. The vertices of a triangle are (4, 3), (8, 4), and (4, 10). What is the ***approximate*** perimeter of the triangle?

   A. 14 units

   B. 18 units

   C. 22 units

   D. 33 units

6. What is the perimeter of a triangle with vertices at (5, 6), (2, 2), and (8, 2)?

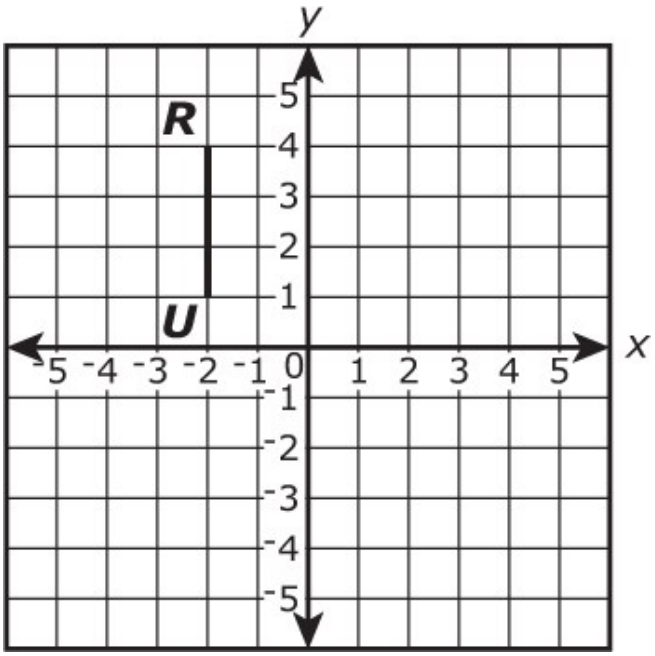
   A. 15 units

   B. 16 units

   C. 17 units

   D. 18 units

7. The area of rectangle *RSTU* is 15 square units. The coordinate of *R* is $(-2, 4)$, and the coordinate of *U* is $(-2, 1)$.



What could be the coordinate of *S*?

   A. (1, 1)

   B. (2, 1)

   C. (3, 4)

   D. (5, 4)

8. What is the ***approximate*** perimeter of a triangle with vertices at (2, 1), (5, 3), and (3, 6)?

   A. 6.8 units

   B. 9.3 units

   C. 12.3 units

   D. 14.7 units

9. What is the ***approximate*** perimeter of the parallelogram with vertices at (2, 4), (4, 1), ($^{-}$2, $^{-}$2), and ($^{-}$4, 1)?

   A. 10.0 units

   B. 10.3 units

   C. 20.0 units

   D. 20.6 units

10. What is the ***approximate*** perimeter of a triangle with vertices at (3, 1), (4, 5), and (6, 4)?

    A. 6.3 units

    B. 10.6 units

    C. 18.0 units

    D. 40.0 units

11. What is the area of the triangle whose vertices are located at ($^{-}$3, 3), (5, 1), and ($^{-}$3, $^{-}$4)?

    A. 14 square units

    B. 25 square units

    C. 28 square units

    D. 56 square units

12. A parallelogram has vertices at (5, 3), (8, 4), (7, 8), and (4, 7). What is the ***approximate*** area of the parallelogram?

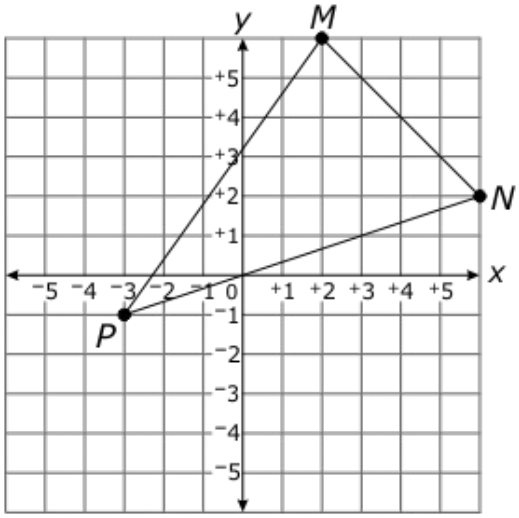
A. 12 units

B. 13 units

C. 17 units

D. 27 units

13. Triangle *MNP* is shown below.



What is the ***approximate*** area of the triangle?

A. 16.97 square units

B. 24.00 square units

C. 24.33 square units

D. 26.83 square units

14. A map of a town is placed onto the coordinate plane where each unit equals one mile.

- John's house is located at point (12, $^{-}$15).
- John leaves his house and drives directly to his school, which is at a point four miles to the east and ten miles north of his house.
- He then leaves the school and drives directly to the store, which is at a point that is 6 miles to the west and 2 miles south of the school.
- John then drives back home.

To the nearest mile, how far did John drive in total?

A. 15 miles

B. 19 miles

C. 25 miles

D. 39 miles

15. The coordinates of quadrilateral *JKLM* are $J(0, 6)$, $K(4, 6)$, $L(4, 3)$, and $M(-4, 3)$. What is the perimeter of quadrilateral *JKLM*?

A. 14

B. 15

C. 18

D. 20

16. The vertices of a square are located at (1, 7), (5, 3), (1, $^{-}$1), and ($^{-}$3, 3). What is the perimeter of the square?

A. $4\sqrt{2}$ units

B. $8\sqrt{2}$ units

C. $16\sqrt{2}$ units

D. $32\sqrt{2}$ units

17. Triangle *RST* has vertices at *R*(7, ⁻4), *S*(12, ⁻12), and *T*(2, ⁻12). What is the ***approximate*** perimeter of triangle *RST*?

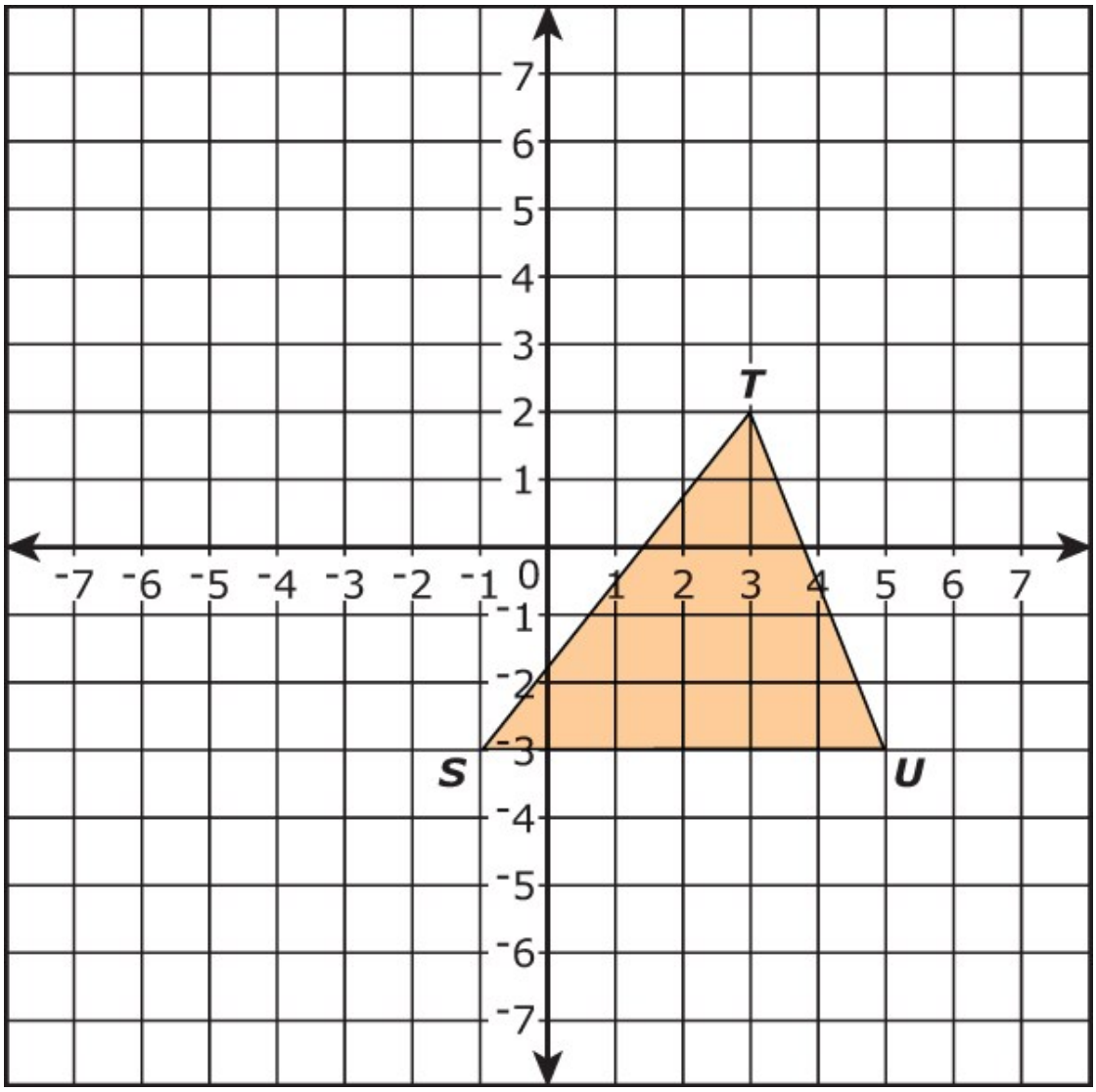
A. 9.4 units

B. 14.5 units

C. 18.9 units

D. 28.9 units

18. Triangle *STU* is graphed on the coordinate plane.



What is the area of Triangle *STU*?

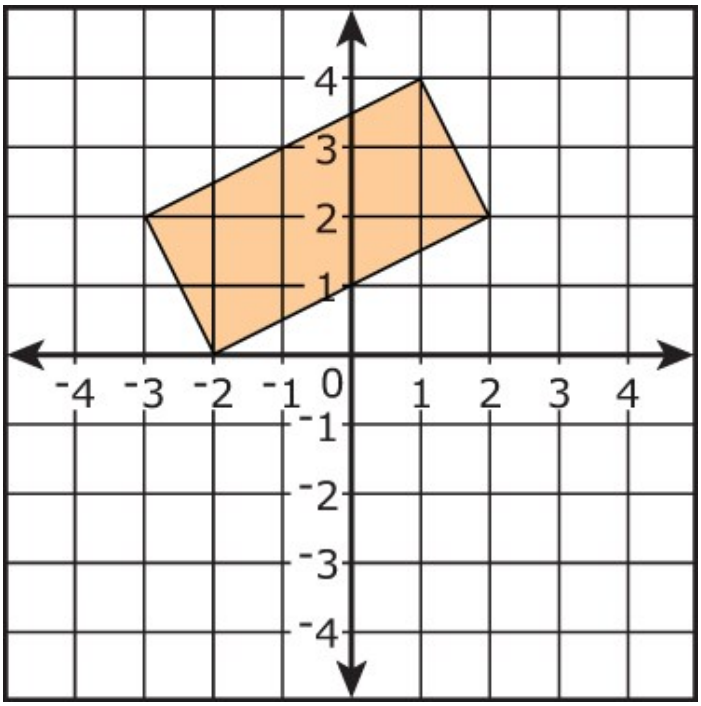
A. 15 square units

B. 18 square units

C. 25 square units

D. 30 square units

19. A rectangle is graphed on the coordinate plane.



Which expression could be used to find the area of the rectangle?

A. $(\sqrt{13})(\sqrt{20})$

B. $(\sqrt{5})(\sqrt{20})$

C. $(\sqrt{3})(\sqrt{6})$

D. $(\sqrt{2})(\sqrt{3})$

20. A parallelogram has vertices at (5, 1), (3, $^{-}$2), ($^{-}$4, $^{-}$4), and ($^{-}$2, $^{-}$1). What is the ***approximate*** perimeter of the parallelogram?

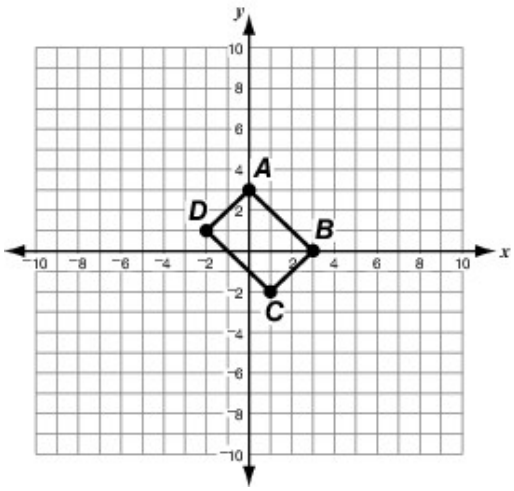
A. 10.89 units

B. 16.25 units

C. 21.77 units

D. 30.68 units

21. Find the area of the rectangle shown in the coordinate grid below.



A. 6 units^2

B. $5\sqrt{2}$ units^2

C. 12 units^2

D. $10\sqrt{2}$ units^2

22. The coordinates of the vertices of a square are (2, 10), (8, 4), (2, $^-$2), and ($^-$4, 4). What is the area of the square?

A. 8.5 units^2

B. 33.9 units^2

C. 36 units^2

D. 72 units^2

23. What is the area of a triangle with vertices at (1, 4), (5, 1), and (8, 5)?

A. 12.5 units^2

B. 17.5 units^2

C. 25 units^2

D. 35 units^2

24. What is the area of a triangle with vertices at (3, 7), (7, 5), and (7, 11)?

A. 32.2 square units

B. 24 square units

C. 16.1 square units

D. 12 square units

25. The vertices of a parallelogram are at ($^{-}$9, 12), ($^{-}$3, 12), ($^{-}$5, 10), and ($^{-}$11, 10). What is the perimeter of the parallelogram?

A. $6+2\sqrt{2}$ units

B. 8 units

C. $12+4\sqrt{2}$ units

D. 16 units

26. What is the area of the quadrilateral with vertices at (1, 3), (3, $^{-}$1), ($^{-}$1, $^{-}$3), and ($^{-}$3, 1)?

A. 5 units^2

B. 10 units^2

C. 20 units^2

D. 40 units^2

27. The vertices of a quadrilateral are located at (0, 0), (9, 5), (4, 7), and (6, $^{-}$2). What is the ***approximate*** perimeter of the quadrilateral?

A. 13 units

B. 27 units

C. 31 units

D. 46 units

28. What is the ***approximate*** perimeter of the parallelogram with vertices (6, 1), (8, 5), ($^{-}$5, 5), and ($^{-}$7, 1)?

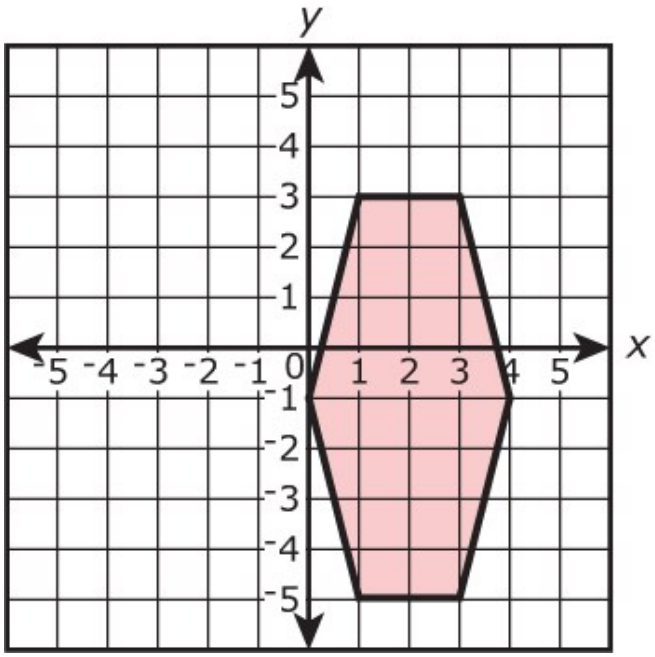
A. 17.5 units

B. 25.6 units

C. 34.9 units

D. 51.3 units

29. A hexagon is graphed on the coordinate plane.



What is the perimeter of the hexagon?

A. 12

B. $6\sqrt{17}$

C. $4 + 4\sqrt{5}$

D. $4 + 4\sqrt{17}$

30. The vertices of a quadrilateral are (2, 10), (8, 4), (2, ⁻2), and (⁻4, 4). What is the perimeter of the quadrilateral?

A. $2\sqrt{2}$ units

B. $6\sqrt{2}$ units

C. $10\sqrt{2}$ units

D. $24\sqrt{2}$ units

31. What is the area of the triangle with vertices at (0, 3), (2, 5), and (3, 0)?

A. 6 units^2

B. 9 units^2

C. 12 units^2

D. 17 units^2

32. Let *b* represent a number greater than 8, such that the perimeter of triangle *ABC,* with vertices at $A(0, 0), B(0, b),$ and $C(6, 8),$ is $29+\sqrt{85}$ units.

What is the area of the triangle, to the nearest thousandth of a square unit?

A. 3.659

B. 27.659

C. 45.000

D. 51.658

33. Sam has a rectangular garden.

- When placed on a coordinate plane, it has vertices at (0, ⁻2), (5, ⁻4), (9, 6), and (4, 8).
- Each unit is equal to 2 feet.

What is the actual area of Sam's garden?

A. 29 square feet

B. 58 square feet

C. 116 square feet

D. 232 square feet

34. Quadrilateral $ABCD$ has vertices at points $A(-1, 10)$, $B(3, 12)$, $C(6, 6)$, and $D(x, 6)$ on a coordinate grid. The distance AD is 5 units and x is positive.

Which whole number measure is **closest** to the perimeter of the quadrilateral?

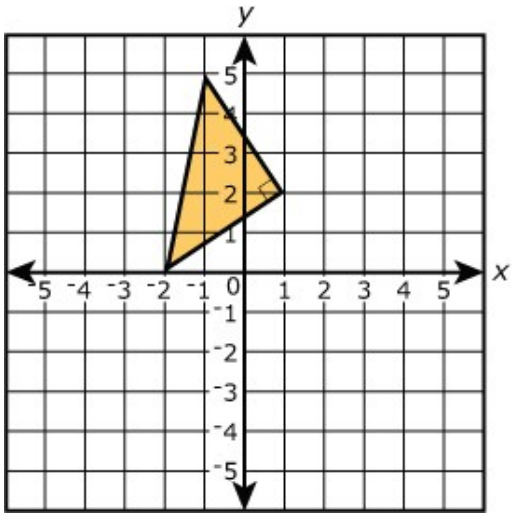
A. 18 units

B. 19 units

C. 20 units

D. 26 units

35. A triangle is graphed on the coordinate plane.



Which expression could be used to find the area of the triangle?

A. $\left(\frac{1}{2}\right)(\sqrt{13})(\sqrt{26})$

B. $\left(\frac{1}{2}\right)(\sqrt{13})(\sqrt{13})$

C. $\left(\frac{1}{2}\right)(\sqrt{5})(\sqrt{6})$

D. $\left(\frac{1}{2}\right)(\sqrt{5})(\sqrt{5})$

36. Which expression represents the perimeter of a triangle with vertices at $(^{-}1, 1)$, $(^{-}3, ^{-}4)$, and $(5, ^{-}2)$?

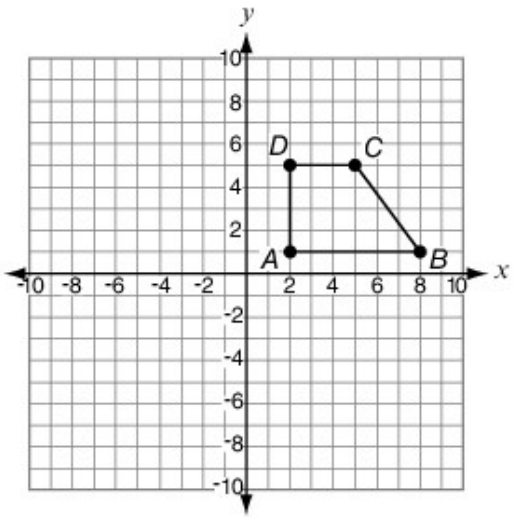
A. $\sqrt{108}$

B. $\sqrt{142}$

C. $3\sqrt{3} + 2\sqrt{15} + \sqrt{21}$

D. $3\sqrt{5} + 2\sqrt{17} + \sqrt{29}$

37. What is the perimeter of the quadrilateral shown in the figure below?



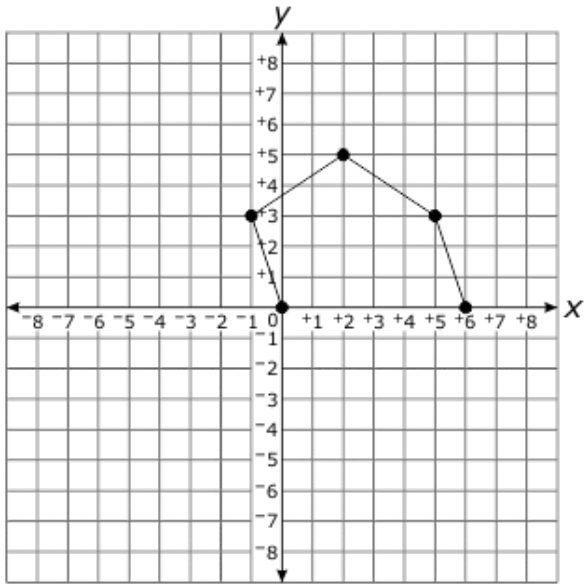
A. 16 units

B. 17 units

C. 18 units

D. 20 units

38. A figure is drawn on the grid below.



What is the ***approximate*** perimeter of the figure?

A. 12.78 units

B. 13.53 units

C. 18.79 units

D. 19.54 units

39. The vertices of a rectangle are located at (3, 2), (11, 6), (9, 10), and (1, 6). What is the area of the rectangle?

A. 20 square units

B. 27 square units

C. 40 square units

D. 160 square units

40. 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

41. Rectangle *QRST* has two vertices at *Q*(⁻9, 5) and *R*(⁻7, 7). If the area of rectangle *QRST* is 16 square units, which could be the coordinates of *S*?

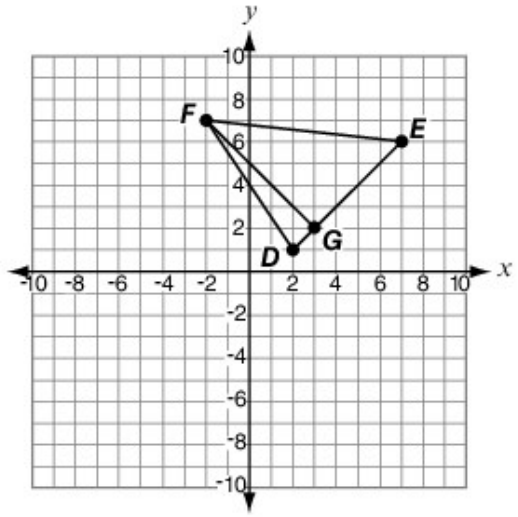
A. (⁻5, 5)

B. (⁻4, 2)

C. (⁻3, 3)

D. (⁻2, 4)

42. In the figure below, the perpendicular drawn from *F* meets $\overline{DE}$ at *G*. What is the area of triangle *FDE*?



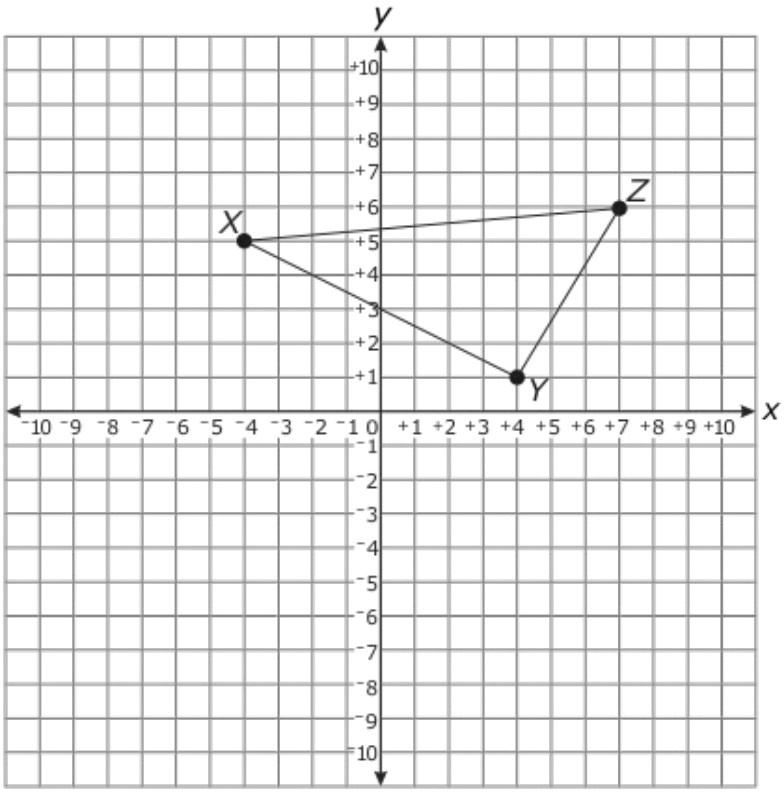
A. 25 square units

B. 50 square units

C. $5\sqrt{26}$ square units

D. $15\sqrt{2}$ square units

43. 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

44. Triangle *PQR* has vertices at ($^-$3, $^-$3), ($^-$2, 3), and (4, $^-$1). What is the ***approximate*** perimeter of triangle *PQR*?

A. 21 units

B. 19 units

C. 15 units

D. 12 units

45. Which group of ordered pairs represents a rectangle with an area of 48 units^2?

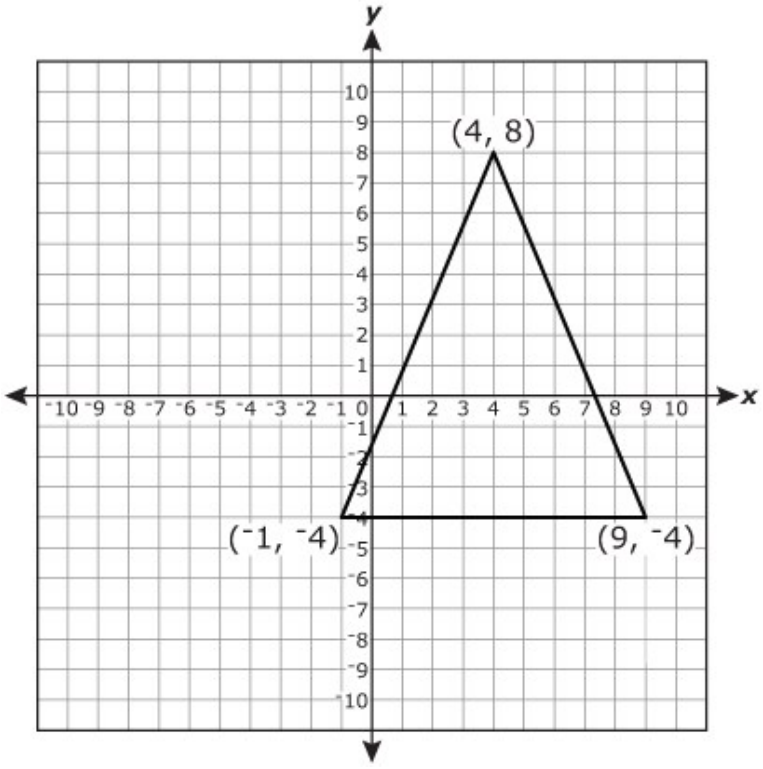
A. $(^{-}4, 6), (8, 6), (8, 2), (^{-}4, 2)$

B. $(4, 6), (8, 6), (8, 2), (^{-}4, 2)$

C. $(8, 10), (5, 10), (5, 3), (8, 3)$

D. $(^{-}8, 10), (5, 10), (5, 3), (8, 3)$

46. What is the perimeter, in units, of the triangle shown on the coordinate grid?



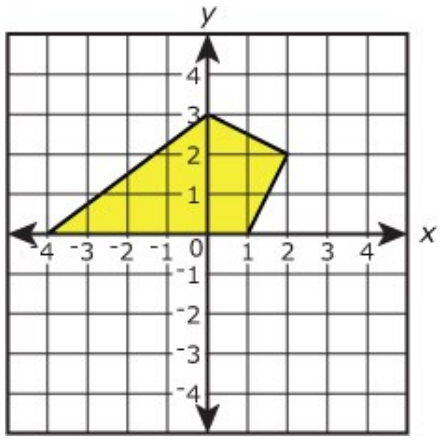
A. 44 units

B. 36 units

C. 34 units

D. 12 units

47. A kite is graphed on the coordinate plane.



What is the perimeter of the kite?

A. 16 units

B. 18 units

C. $9 + \sqrt{17}$ units

D. $10 + 2\sqrt{5}$ units