Date Completed: _____
Mentor Initials: _____

Geometry (Basic)

1. The sides of a square are 5 cm long. One vertex of the square on a coordinate plane is at $(2,0)$. Which of the following points could also be a vertex of this square?

A. $(0,5)$
B. $(2,7)$
C. $(5,0)$
D. $(7,2)$
E. $(7,5)$

2. Kylie drew a pie chart to describe her time spent at work one 8-hour day. She showed the pie chart to her math teacher at school, who asked her to find the central angles associated with each activity. Of those 8 hours, she spent 1 hour scheduling appointments. What is the central angle associated with "scheduling appointments"?

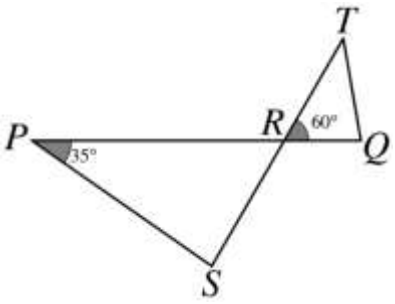
A. 30°
B. 35°
C. 45°
D. 55°
E. 65°

3. In a plane, $\overleftrightarrow{AB}$ and $\overleftrightarrow{DE}$ intersect at C, where C is between A and B. The measure of $\angle ACE$ is 82°. What is the measure of $\angle ECB$?

A. 85°
B. 98°
C. 112°
D. 127°
E. 132°

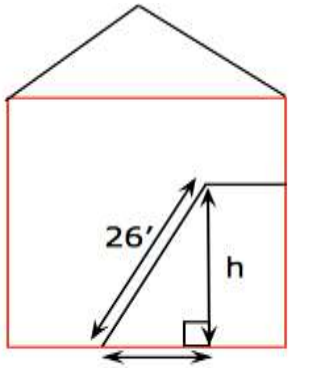
4. In the figure to the right, R is the intersection of $\overline{PQ}$ and $\overline{ST}$. If it can be determined, what is the measure of $\angle PSR$ in degrees?

A. 65°
B. 75°
C. 85°
D. 90°
E. Cannot be determined from the given information.

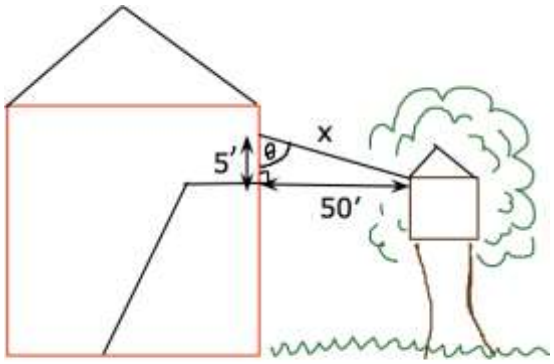


Use the information below to answer questions 5 – 6.

Kevin is drawing blueprints of his home to develop a safety plan. The blueprints are shown below.



Staircase Blueprints



Zip Line Blueprints

5. Kevin measures the base of the staircase to be 10 feet from the wall, and the actual staircase is 26 feet in length. What is the height, h, of the wall in feet?

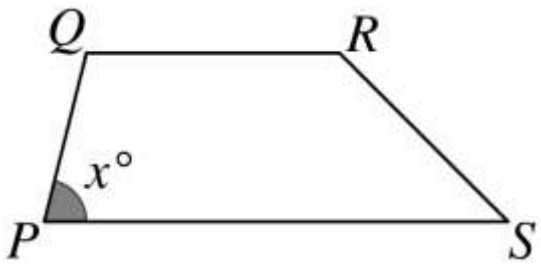
A. 12
B. 15
C. 23
D. 24
E. 25

6. Kevin carries out a similar process in an effort to measure the length of the zip line. He measures that the top of the zip line is connected 5′ about the second story floor, and that the side of his tree fort is 50′ from the house. How long is the zip line, to the nearest hundredth of a foot?

A. 50.25
B. 52.95
C. 54.65
D. 58.80
E. 60.25

7. Trapezoid $PQRS$ is shown to the right. $\overline{QR} \parallel \overline{PS}$, and the measure of $\angle P$ is x degrees. What is the degree measure of $\angle PQR$ in terms of x ?

A. x
B. $180 + x$
C. $180 - x$
D. $\frac{360-x}{2}$
E. $\frac{180+x}{2}$



Use the information below to answer questions 8 – 9.

A physics lab group plans to construct a ramp to test the speed of their toy car. One of the lab group members sketches a plan for the setup, where the top of the ramp lies against a 3-foot-high table, and the base of the ramp rests on the ground exactly 4 feet from the base of the table.

8. If the material for the ramp costs \$1.25 per foot of board length, how much will the board for the ramp cost?

A. \$4.00
B. \$5.00
C. \$5.25
D. \$5.75
E. \$6.25

9. The lab group realizes that the table they plan to rest the ramp against is actually 3.5 feet in height, not 3 feet. If they set the experiment up anyway, how far away from the base of the table will the base of the ramp-board meet the ground, to the nearest tenth of a foot?

A. 3.0
B. 3.6
C. 4.0
D. 4.2
E. 5.2

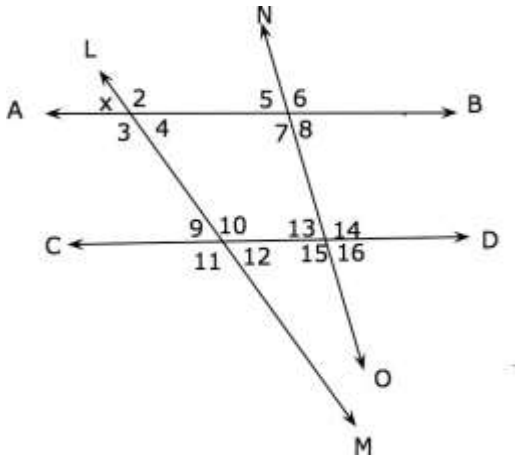
10. Jacinda pounded a stake into the ground. After she attached a leash to both her dog's collar and the stake, the dog could reach 7 feet from the stake in any direction. Using 3.14 for π, what is the approximate area, in square feet, the dog could reach from the stake?

A. 22
B. 44
C. 49
D. 69
E. 154

11. In a plane, lines $\overline{MN}$ and $\overline{PQ}$ intersect at O, where O is between M and N. The measure of $\angle QON$ is 53°. What is the measure of $\angle QOM$?

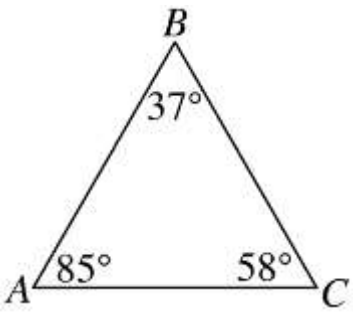
A. 47°
B. 53°
C. 67°
D. 117°
E. 127°

12. In the diagram below, $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$. Which of the following sets of angles are supplementary to $\angle x$?



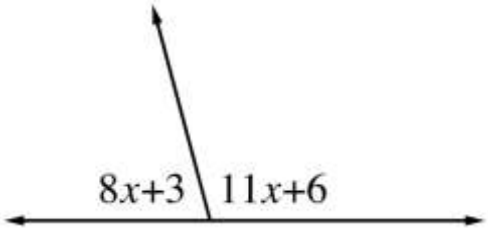
A. 2, 3, 6, 7, 11, 10, 14, 15
B. 2, 3, 11, 12
C. 2, 3, 10, 11
D. 4, 8, 12, 16
E. 5, 8, 9, 12, 13, 16

13. An inquisitive eight-year-old student interested in learning geometry draws the triangle to the right. His triangle is drawn as equilateral, yet he writes in unequal angle measurements. If this triangle were indeed drawn to scale, how should the side lengths rank from shortest to longest?



A. $\overline{AB} < \overline{BC} < \overline{AC}$
B. $\overline{AC} < \overline{AB} < \overline{BC}$
C. $\overline{BC} < \overline{AC} < \overline{AB}$
D. $\overline{AC} < \overline{BC} < \overline{AB}$
E. $\overline{BC} < \overline{AB} < \overline{AC}$

14. What is the measure of the larger angle in the figure to the right?



A. 75°
B. 85°
C. 100°
D. 105°
E. 115°

15. A 6-inch-by-8-inch photograph was cut to fit exactly into a 5-inch-by-7-inch frame. What is the area, in square inches, of the part of the photograph that was cut off?

A. 11
B. 13
C. 15
D. 17
E. 19

16. Two sides of a triangle are equal in length. The third side is 5 inches longer than either of the other 2 sides. Given that the perimeter of the triangle is 86 inches, what is the length, in inches, of the longest side?

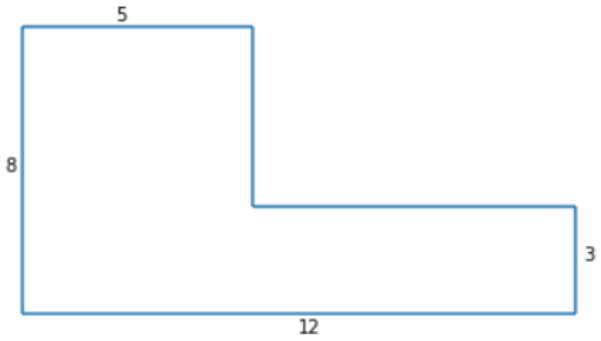
A. 21
B. 26
C. 30
D. 32
E. 33

17. Bryson purchased a 30-meter-long roll of chain-link fence. He used the entire roll of fence to construct a rectangular pen for his chickens. Given that the pen is 6 meters long, what is its width, in meters?

A. 5
B. 9
C. 12
D. 18
E. 24

18. In the figure shown below, all angles are right angles, and the side lengths given are in centimeters. What is the area, in square centimeters, of the figure?

A. 53
B. 57
C. 61
D. 67
E. 71



19. On a bike trail, there are 5 checkpoints numbered in order, Checkpoint 1 through Checkpoint 5, as shown in the figure below. Some distances along the trail between 2 checkpoints are given: 5.5 miles between 1 and 3; 3.4 miles between 2 and 3; and 8.4 miles between 2 and 5. Which of the following values is closest to the distance, in miles, along the trail between Checkpoint 1 and Checkpoint 5?

A. 10.5
B. 11.1
C. 11.6
D. 12.8
E. 13.2