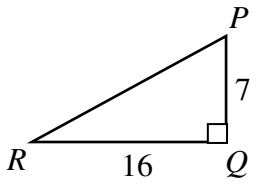
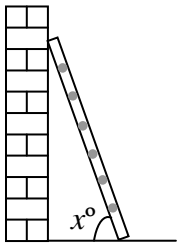
1. What is the measure of $\angle R$?



A. $m\angle R \approx 23.6°$
B. $m\angle R \approx 25.9°$
C. $m\angle R \approx 64.1°$
D. $m\angle R \approx 66.4°$

2. You lean a 16 foot ladder against the wall. If the base is 4 feet from the wall, what angle does the ladder make with the ground? *Round your answer to the nearest tenth.*



A. 76.0°
B. 75.5°
C. 14.8°
D. 14.0°

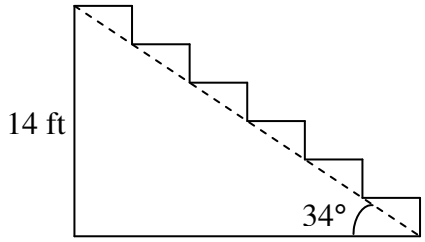
3. Which regular polygon has interior angles with measures greater than 130°?

A. regular octagon (8 sides)
B. regular heptagon (7 sides)
C. regular hexagon (6 sides)
D. regular pentagon (5 sides)

4. A quadrilateral has four equal angles. Which statement about this quadrilateral ***must*** be true?

A. It is a kite.
B. It is a rhombus.
C. It is a square.
D. It is a rectangle.

5. A new store is being built. An escalator is being planned. If the vertical distance between floors is 14 feet, how long will the escalator be? Round your answer to the nearest tenth.



A. 7.8 ft
B. 16.9 ft
C. 20.8 ft
D. 25.0 ft

6. Which statement about rhombuses is ***true***?

A. If one pair of adjacent sides of a quadrilateral are congruent, then the quadrilateral is a rhombus.

B. If one pair of adjacent sides of a parallelogram are congruent, then the parallelogram is a rhombus.

C. If all four angles of a quadrilateral are congruent, then the quadrilateral is a rhombus.

D. If all four angles of a parallelogram are congruent, then the parallelogram is a rhombus.

7. What is the area of a regular hexagon with a perimeter of 36 in and an apothem of 5.2 in?

A. 62.4 in^2
B. 93.6 in^2
C. 187.2 in^2
D. 72.0 in^2

8. How many sides will a regular polygon have if each interior angle has a measure of 140°?

A. 12
B. 10
C. 9
D. 8

9. What is the perimeter of a regular pentagon with sides 8 cm long?

A. 40 cm
B. 64 cm
C. 48 cm
D. 72 cm

10. What is the correct ratio for the cosine function?

A. $\frac{opposite\ side}{hypotenuse}$

B. $\frac{opposite\ side}{adjacent\ side}$

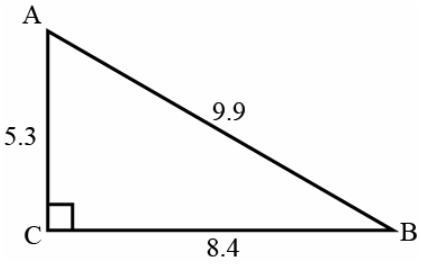
C. $\frac{adjacent\ side}{hypotenuse}$

D. $\frac{adjacent\ side}{opposite\ side}$

11. *sin* 67° ≈ _____?

A. 0.3907
B. 0.8555
C. 0.9205
D. 2.35

12. *tan A* ≈ _____?



A. 1.18
B. 0.85
C. 0.63
D. 1.58

13. What is the approximate value of tan 27° to four decimal places?

A. –3.2737
B. .5095
C. .8910
D. 1.5338

14. Given polygon *ABCD* is similar to polygon *QRST*. If $AD = 17$, $QT = 12$, and the perimeter of polygon *ABCD* is 51, what is the perimeter of polygon *QRST*?

A. 4
B. 36
C. 38
D. 72

15. Given: $\overline{AB} \cong \overline{BC}$

$\angle 1 \cong \angle 2$

Prove: $\overline{AD} \cong \overline{CB}$

Which reasons given below could be used for step 3 of the proof?

Statements	**Reasons**
1. $\overline{AB} \cong \overline{CD}$, $\angle 1 \cong \angle 2$	1. Given
2. $\overline{AC} \cong \overline{AC}$	2. Congruence of segments is reflexive.
3. $\triangle ABC \cong \triangle CDA$	3.
4. $\overline{AD} \cong \overline{CB}$	4. CPCTC

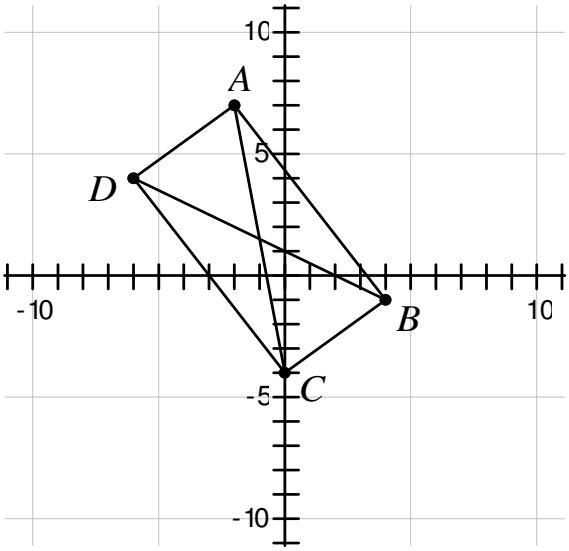
A. AAS
B. ASA
C. SSS
D. SAS

16. Which of the following is a valid conclusion based on the statements below?

Statement 1: **If Sarah doesn't watch television, then she reads.**
Statement 2: **If Sarah reads, then she uses her imagination.**

A. If Sarah uses her imagination, then she doesn't watch television.
B. If Sarah doesn't use her imagination, then she doesn't watch television.
C. If Sarah reads, then she doesn't watch television.
D. If Sarah doesn't watch television, then she uses her imagination.

17. What is the length of the diagonals in rectangle $ABCD$ with $A(-2, 7)$, $B(4, -1)$, $C(0, -4)$, $D(-6, 4)$?



A. $10\sqrt{5}$
B. $5\sqrt{5}$
C. 10
D. 5

18. A polygon has four sides and no right angles. Opposite sides of this polygon are parallel and equal in length. The polygon cannot be a…

A. parallelogram
B. rectangle
C. quadrilateral
D. rhombus

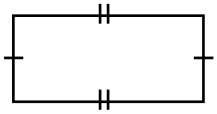
19. The sum of the measures of the interior angles of an octagon is _____?

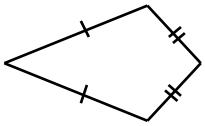
A. 900°
B. 1080°
C. 1260°
D. 1440°

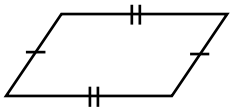
20. Which of the following statements is true?

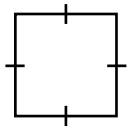
A. The diagonals of a quadrilateral are always congruent.
B. The diagonals of a parallelogram always bisect each other.
C. The diagonals of a rectangle are always perpendicular to each other.
D. The diagonals of a rhombus are always congruent and perpendicular to each other.

21. Which figure shown below is a rhombus?

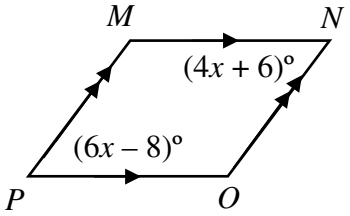
A. 

B. 

C. 

D. 

22. What is the value of x in the quadrilateral $MNOP$?



A. $x = 4$
B. $x = 5$
C. $x = 6$
D. $x = 7$

23. What do all rectangles have that some parallelograms do not have?

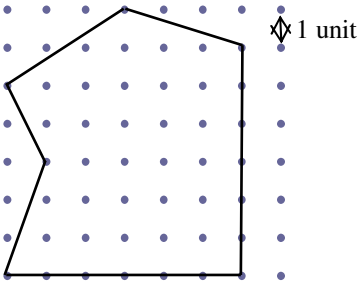
A. Opposite angles that are congruent
B. Diagonals that are congruent
C. Opposite sides that are congruent
D. Diagonals that bisect each other

24. Polygon *ABCD* has the following coordinates. What type of polygon is represented by these coordinates?

A(4, 0), *B*(0, 2), *C*(–7, 0), *D*(0, –2)

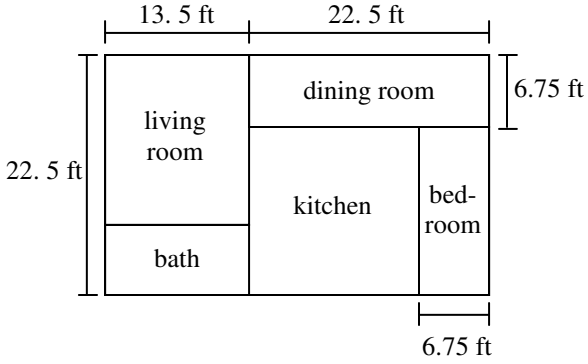
A. trapezoid
B. rectangle
C. rhombus
D. kite

25. What is the area of the polygon shown below?



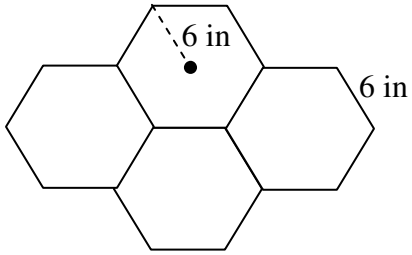
A. 32 square units
B. 35 square units
C. 42 square units
D. 49 square units

26. What is the area of the kitchen? Round your answer to the nearest tenth.



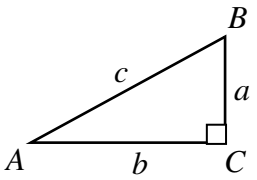
A. 151.9 square feet
B. 212.6 square feet
C. 248.1 square feet
D. 303.6 square feet

27. The cost of ceramic tiling is $.03 per square inch. If each regular hexagon has a radius of 6 inches and a side length of 6 inches, what would be the cost of tiling the floor design shown?



A. $11.22
B. $4.32
C. $3.74
D. $1.87

28. What is the trigonometric ratio for cos *A*?



A. $\cos A = \frac{c}{b}$

B. $\cos A = \frac{a}{c}$

C. $\cos A = \frac{a}{b}$

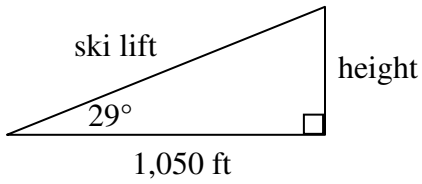
D. $\cos A = \frac{b}{c}$

29. Three facts are given:
- A rectangle is a parallelogram with 4 right angles.
- A parallelogram is a quadrilateral with parallel opposite sides.
- A rhombus is a parallelogram with 4 sides of equal length.

Using deductive reasoning, which of the following conclusions can be made?

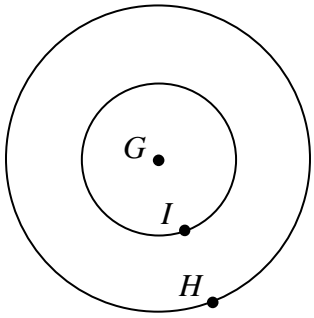
A. The opposite sides of a rhombus and a rectangle are parallel.
B. A rhombus has 4 right angles.
C. A rectangle has 4 sides of equal length.
D. A parallelogram has 4 right angles

30. A ski lift if being built along a 1,050-foot stretch of land. The incline of the lift will be 29°, as shown in the diagram. Which of the following best represents the height of the lift?



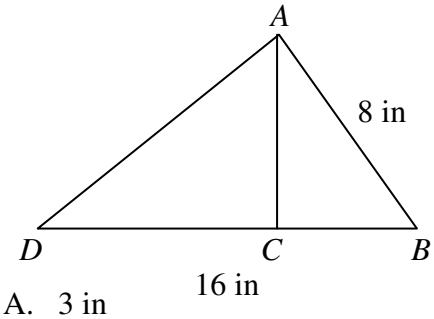
A. 509 feet
B. 582 feet
C. 918 feet
D. 1,894 feet

31. In the diagram shown below, $GI = 2$ in and $GH = 4$ in. The area of the smaller circle is 4π and the area of the larger circle is 16π. If a point is randomly chosen inside the larger circle, what is the probability that it will also be in the smaller circle?



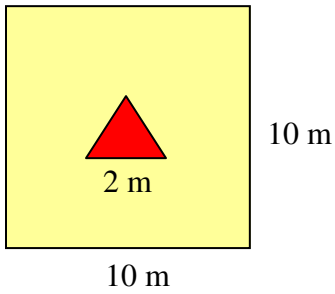
A. 2.0
B. 0.50
C. 0.25
D. 0.20

32. ΔABD is a right triangle where $m\angle BAD = 90°$, and $\overline{AC}$ is perpendicular to $\overline{BD}$. If $AB = 8$ inches and $DB = 16$ inches, what is BC?



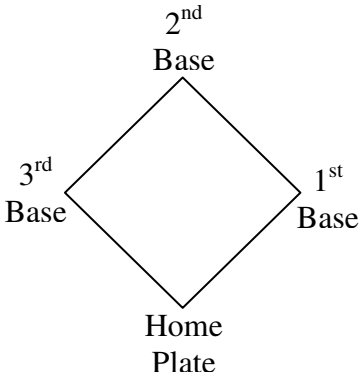
A. 3 in
B. 4 in
C. 5 in
D. 6 in

33. When a skydiver jumps from an airplane, they usually have a landing area already in mind before the jump. If they wanted to land in the target below, what is the probability that they will hit the target (an equilateral triangle with sides of 2 m), assuming that they are certain to land within the 10m x 10m square? Round your answer to the nearest hundredth.



A. 0.05
B. 0.04
C. 0.02
D. 0.01

34. A high school baseball infield is in the shape of a perfect square with the distance between each consecutive base equal to 90 feet. What is the exact distance from home plate to 2nd base?



A. $\frac{90}{\sqrt{2}}$ ft
B. 90 ft
C. $90\sqrt{2}$ ft
D. 180 ft

35. What is the measure of one of the interior angles of a regular polygon with ten sides?

A. 18^{o}
B. 36^{o}
C. 144^{o}
D. 162^{o}