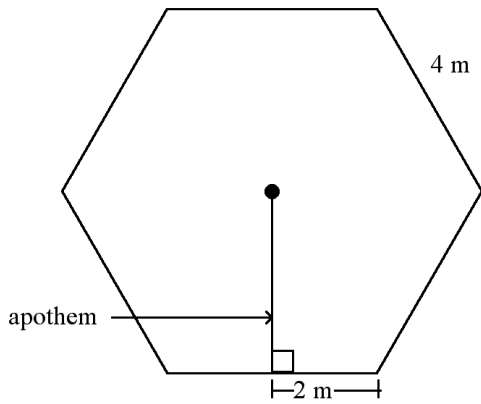1. Find the area of a regular hexagon with side length 4 meters. Round to the nearest tenth.
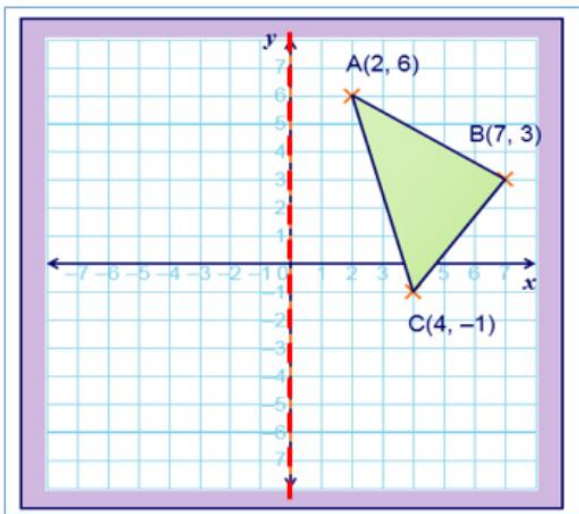
4 m

apothem

⊢2 m⊣
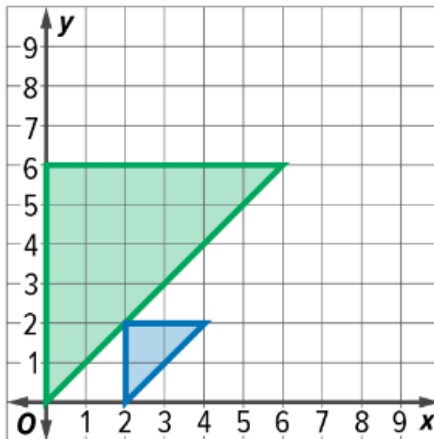
Ⓐ 83.1 m²

Ⓑ 24 m²

Ⓒ 41.6 m²

Ⓓ 20.8 m²

2.

A(2, 6)

B(7, 3)

C(4, −1)

Given the pre-image △ABC as shown above, find the coordinates of A', B', and C' if the triangle is reflected over the y-axis.

A'(,   ) B'(,   ) C'(,   )

3.

If the blue triangle is a preimage and the green triangle is the image, what is the scale factor of the dilation? Type the correct number into the box.

scale factor = ☐

Note: the blue triangle is smaller.

4. In 1870, the Cape Hatteras Lighthouse was built 1500 feet from the Atlantic Ocean. By 1999, after decades of soil erosion, the lighthouse was in danger as it was then only 120 feet from the ocean. The decision was made to move the lighthouse 1506 feet south and 540 feet west. Assuming that the positive *y*-axis is north, which function represents the translation coordinates of the lighthouse?

Ⓐ $(x, y) \rightarrow (x + 540, y + 1506)$

Ⓑ $(x, y) \rightarrow (x - 540, y - 1506)$

Ⓒ $(x, y) \rightarrow (x - 1506, y - 540)$

Ⓓ $(x, y) \rightarrow (x - 1506, y + 540)$

5.

Type the correct measure into each box. Round to the nearest whole number if necessary.

33 m

13 m   x m   y m

                                45°

5 m   z m
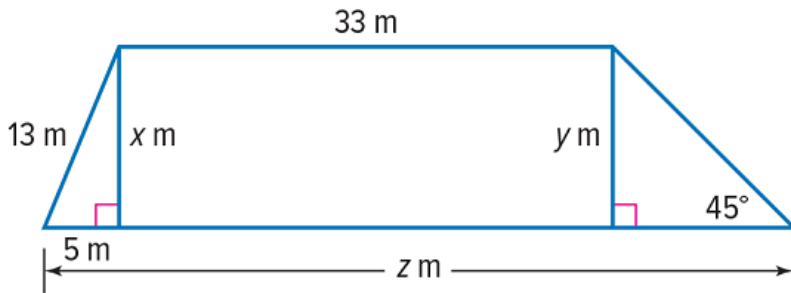
x = [   ]   y = [   ]   z = [   ]

Area = [   ] m²   Perimeter = [   ] m

6. The line containing $(3, 5)$ and $(-1, -3)$ is perpendicular to the line containing $(2, 3)$ and $(m, 7)$. What is the value of *m* that satisfies this condition?

m = [   ]

7. A searchlight located 200 meters from a weather office shines directly overhead. The angles of elevation to the spot of light on the clouds is 35°. The weather forecaster needs to know the altitude of the cloud ceiling.

A. Write an equation to represent the situation.

[⇕]

B. What is the altitude of the cloud ceiling to the nearest meter?

[⇕]

8.

What is the value of x for $m\overset{\frown}{AB} = 45$ and $m\overset{\frown}{CD} = 42$?
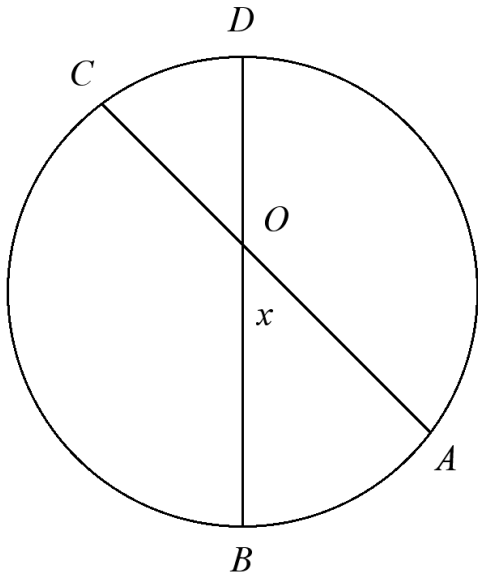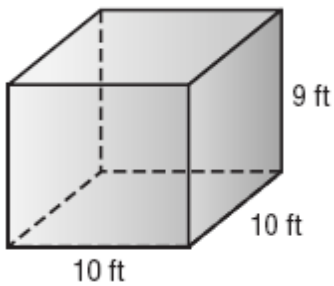
(A) 3   (C) 66

(B) 43.5   (D) 87

9. Rebecca is loading medical supply boxes into a crate. Each supply box is 1.5 feet tall, 1 foot wide, and 2 feet deep. The crate is 9 feet high, 10 feet wide, and 10 feet deep. What is the maximum number of supply boxes she can pack in this crate?

(A) 200   (C) 450

(B) 300   (D) 600

10. Emily has a rectangular deck in her backyard with an area of 96 square feet. She wants to increase the size of the deck by doubling each dimension. What will the area of the deck be after she doubles the length and width?
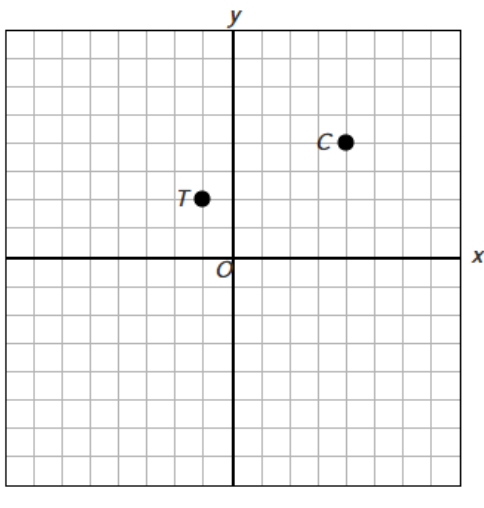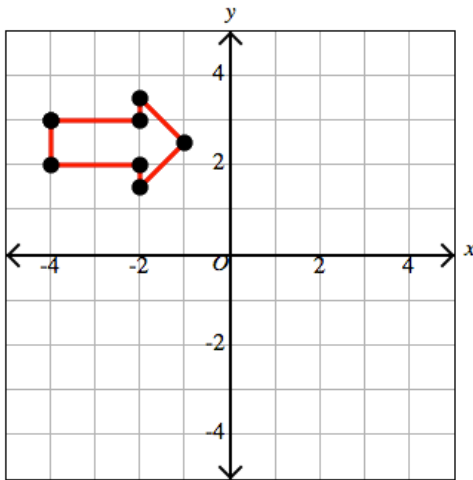
(A) 144 ft²   (C) 226 ft²

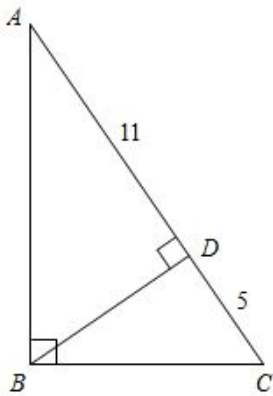(B) 192 ft²   (D) 384 ft²

11. Circle A has center at C and contains point T. A second circle is tangent to circle C at point T and has the same area. Select a place on the coordinate grid to plot the center of the second circle. Find the exact area of circle A in square units.

12. Drag the given figure to perform a translation $(x, y) \rightarrow (x + 1, y - 5)$.
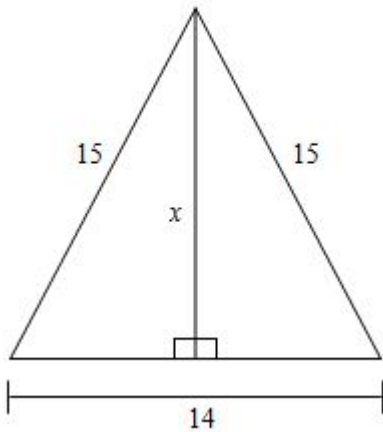
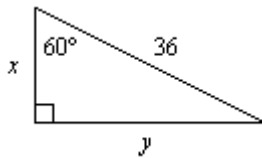13. Find the measure of $\overline{BD}$.

(A) 8

(B) 55

(C) 4

(D) $\sqrt{55}$

14. Find x.

15 / 15

x

14

(A) 22

(C) $4\sqrt{11}$

(B) $\sqrt{274}$

(D) 8
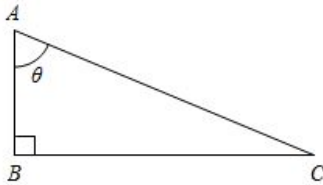
15. Find x and y.

60°   36

x

y

(A) $x = 18\sqrt{3}, y = 18$

(C) $x = 36\sqrt{3}, y = 36$

(B) $x = 18, y = 18\sqrt{3}$

(D) $x = 36, y = 36\sqrt{3}$

16. Express each trigonometric ratio as a fraction for angle θ, when $AC = 26$ and $BC = 24$.

A

θ

B C

(A) $\sin\theta = \dfrac{12}{13}, \cos\theta = \dfrac{5}{13}, \tan\theta = \dfrac{5}{12}$

(C) $\sin\theta = \dfrac{5}{13}, \cos\theta = \dfrac{12}{13}, \tan\theta = \dfrac{12}{5}$

(B) $\sin\theta = \dfrac{5}{13}, \cos\theta = \dfrac{12}{13}, \tan\theta = \dfrac{5}{12}$

(D) $\sin\theta = \dfrac{12}{13}, \cos\theta = \dfrac{5}{13}, \tan\theta = \dfrac{12}{5}$

17. A community is building a square park with sides that measure 120 meters. To separate the picnic area from the play area, the park is split by a diagonal line from opposite corners. Determine the approximate length of the diagonal line that splits the square. If necessary, round your answer to the nearest meter.
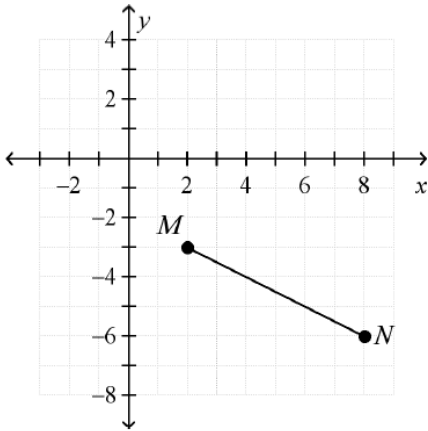
120 m

Picnic area

Play area
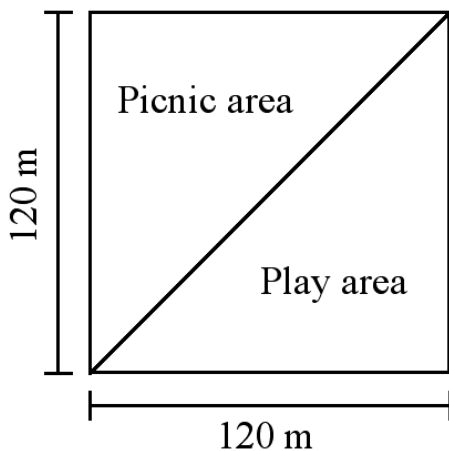
120 m

(A) 28,800 meters

(C) 240 meters

(B) 170 meters

(D) 120 meters

18. To the nearest tenth, what is the length, in units, of $\overline{MN}$?

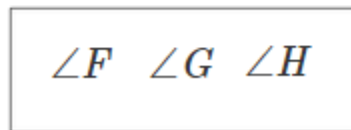(A) 6.0

(C) 9.0

(B) 6.7

(D) 9.1

19.

In $\triangle FGH$, $m\angle F = 4x + 2$, $m\angle G = 13x - 7$, and $m\angle H = 3x + 5$.
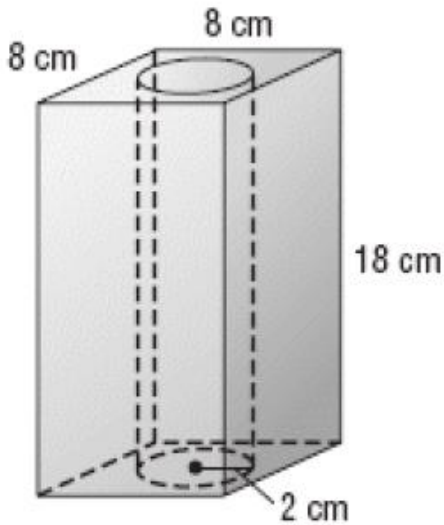
Drag the sides to order them from the shortest to longest.

$$\overline{FH} \quad \overline{GH} \quad \overline{FG}$$

Drag the angles to order them from the smallest to largest.

$$\angle F \quad \angle G \quad \angle H$$

20. A square-based prism has a cylindrical hole bored through the middle as shown in the diagram below. What is the approximate remaining volume of the prism? Use 3.14 for π.

8 cm

8 cm

8 cm

18 cm

2 cm

cm³