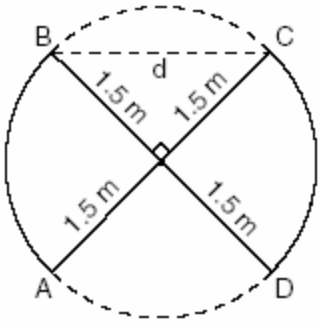
NAME:_____

1. 010403b, P.I. G.G.48
An overhead view of a revolving door is shown in the accompanying diagram. Each panel is 1.5 meters wide.

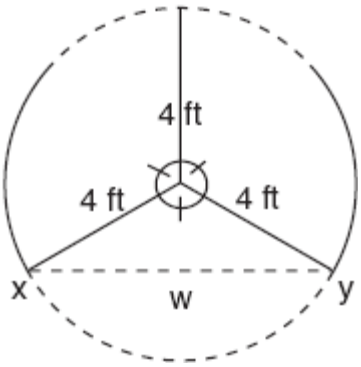


What is the approximate width of *d*, the opening from *B* to *C*?

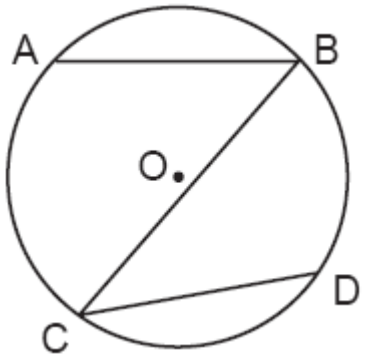
[A] 1.50 m [B] 2.12 m

[C] 3.00 m [D] 1.73 m

2. 010722b
The accompanying diagram shows a revolving door with three panels, each of which is 4 feet long. What is the width, *w*, of the opening between *x* and *y*, to the *nearest tenth of a foot*?



3. 060811b, P.I. G.G.49
In the accompanying diagram of circle *O*, $\overset{\frown}{AB} \cong \overset{\frown}{CD}$.

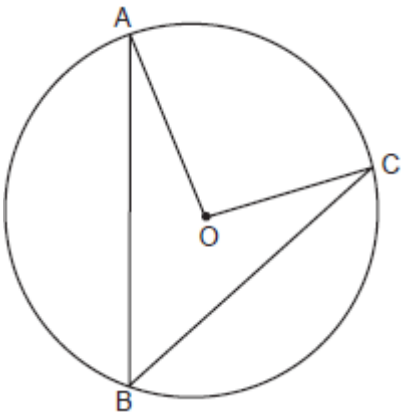


Which statement is true?

[A] $\angle ABC \cong \angle BCD$ [B] $\overline{AB} \| \overline{CD}$

[C] $\overline{AB} \cong \overline{CD}$ [D] $\overset{\frown}{AC} \cong \overset{\frown}{BD}$

4. 060802b, P.I. G.G.51
In the accompanying diagram of circle *O*, $\overline{AB}$ and $\overline{BC}$ are chords and $m\angle AOC = 96$. What is $m\angle ABC$?

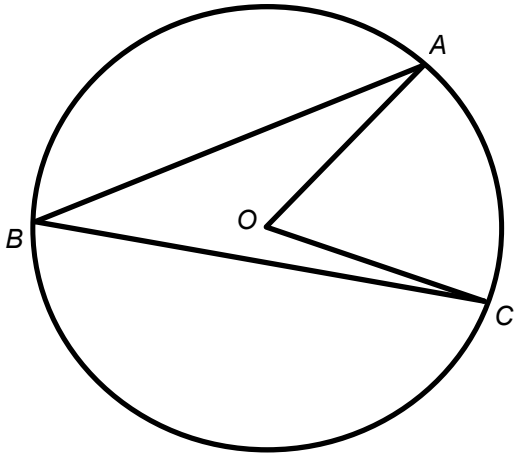


[A] 96 [B] 48 [C] 32 [D] 192

NAME:_____

5. fall9914b, P.I. G.G.51

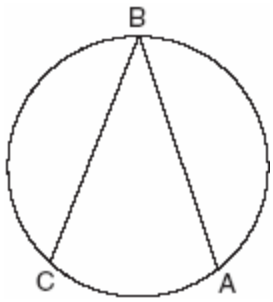
In the diagram below, circle O has $m\angle ABC = z$. What is $m\angle AOC$?



[A] $\frac{1}{2}z$ [B] $2z$ [C] z^2 [D] z

6. 080107b, P.I. G.G.51

The new corporate logo created by the design engineers at Magic Motors is shown in the accompanying diagram.

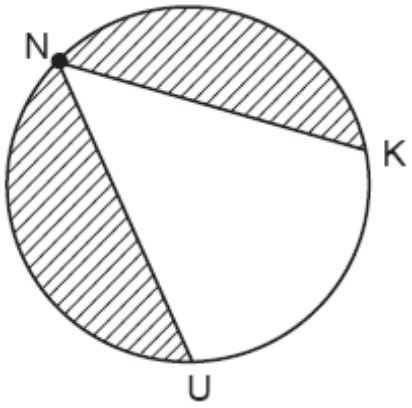


If chords $\overline{BA}$ and $\overline{BC}$ are congruent and $m\widehat{BC} = 140$, what is $m\angle B$?

[A] 80 [B] 140 [C] 280 [D] 40

7. 080803b, P.I. G.G.51

The NUK Energy Company is designing a new logo, as shown in the accompanying diagram, with $m\widehat{NK} = 130$ and $m\widehat{NK} = m\widehat{NU}$.

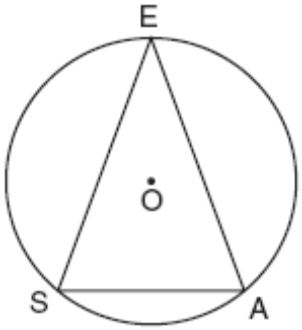


What is the measure of $\angle KNU$?

[A] 65° [B] 80° [C] 100° [D] 50°

8. 080629b, P.I. G.G.51

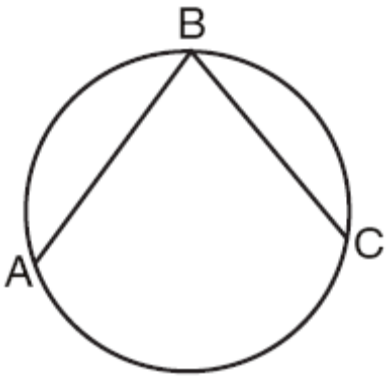
A machine part consists of a circular wheel with an inscribed triangular plate, as shown in the accompanying diagram. If $\overline{SE} \cong \overline{EA}$, $SE = 10$, and $m\widehat{SE} = 140$, find the length of $\overline{SA}$ to the *nearest tenth*.



NAME:_____

9. 060203b

In the accompanying diagram, the length of $\overset{\frown}{ABC}$ is $\frac{3\pi}{2}$ radians.



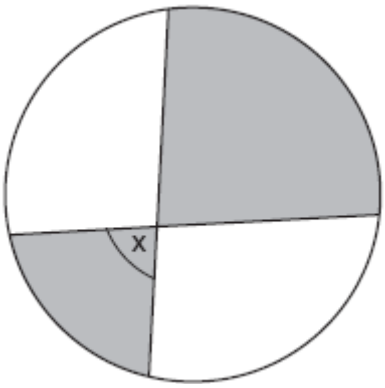
(Not drawn to scale)

What is $m\angle ABC$?

[A] 72 [B] 53 [C] 36 [D] 45

10. 080408b, P.I. G.G.51

The accompanying diagram shows a child's spin toy that is constructed from two chords intersecting in a circle. The curved edge of the larger shaded section is one-quarter of the circumference of the circle, and the curved edge of the smaller shaded section is one-fifth of the circumference of the circle.

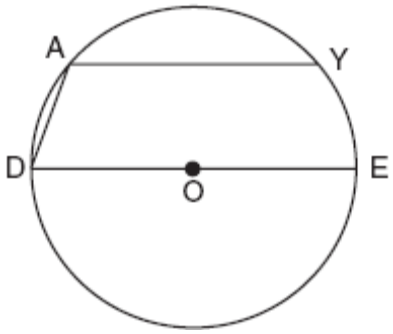


What is the measure of angle x?

[A] 72° [B] 81° [C] 40° [D] 108°

11. 060603b, P.I. G.G.52

In the accompanying diagram of circle O, chord $\overline{AY}$ is parallel to diameter $\overline{DOE}$, $\overline{AD}$ is drawn, and $m\overset{\frown}{AD} = 40$.

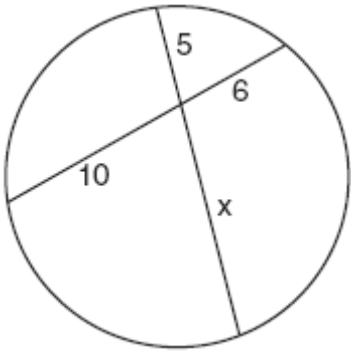


What is $m\angle DAY$?

[A] 150 [B] 110 [C] 90 [D] 130

NAME:_____

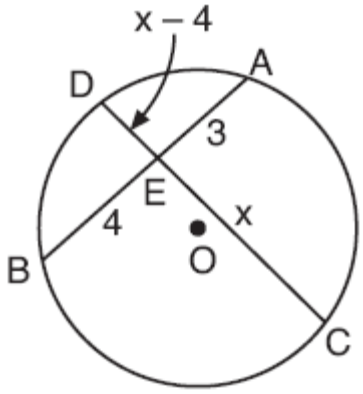
12. 010908b, P.I. G.G.53
The accompanying diagram shows two intersecting paths within a circular garden.



What is the length of the portion of the path marked *x*?

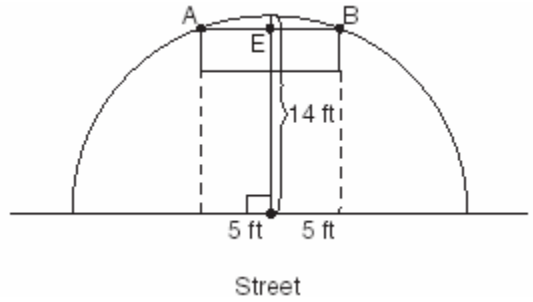
[A] 11 [B] 3 [C] $8\frac{1}{3}$ [D] 12

13. 060723b, P.I. G.G.53
In the accompanying diagram of circle *O*, chords $\overline{AB}$ and $\overline{CD}$ intersect at *E*. If $AE = 3$, $EB = 4$, $CE = x$, and $ED = x - 4$, what is the value of *x*?



14. 080225b, P.I. G.G.53
A toy truck is located within a circular play area. Alex and Dominic are sitting on opposite endpoints of a chord that contains the truck. Alex is 4 feet from the truck, and Dominic is 3 feet from the truck. Meira and Tamara are sitting on opposite endpoints of another chord containing the truck. Meira is 8 feet from the truck. How many feet, to the *nearest tenth of a foot*, is Tamara from the truck? Draw a diagram to support your answer.

15. 080124b P.I. G.G.49
The accompanying diagram shows a semicircular arch over a street that has a radius of 14 feet. A banner is attached to the arch at points *A* and *B*, such that $AE = EB = 5$ feet. How many feet above the ground are these points of attachment for the banner?



[1] B

[2] 6.9, and appropriate work is shown, such as using special right triangles, the Law of Cosines, or the Law of Sines.
[1] Appropriate work is shown, but one computational or rounding error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] 6.9, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
[2]

[3] C

[4] B

[5] B

[6] D

[7] D

[4] 6.8, and appropriate work is shown, such as using the Law of Cosines or the Law of Sines or right triangle trigonometry.
[3] Appropriate work is shown, but one computational or rounding error is made.
or [3] 3.4, and appropriate work is shown, such as $\cos 70 = \frac{x}{10}$ or $\sin 20 = \frac{x}{10}$.
[2] Appropriate work is shown, but two or more computational or rounding errors are made.
or [2] Appropriate work is shown, but one conceptual error is made, such as using an incorrect trigonometric function.
or [2] Correct substitution is made into the Law of Sines or the Law of Cosines, but no further correct work is shown.
[1] Appropriate work is shown, but one conceptual error and one computational or rounding error are made.
or [1] The measures of $\widehat{EA}$ and $\widehat{SA}$ are found correctly, but no further correct work is shown.
or [1] The measures of the three angles of triangle *SEA* are found correctly, but no further correct work is shown.
or [1] 6.8, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
[8]

[9] D

[10] B

[11] B

[12] D

[2] 6, and appropriate work is shown.
[1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] Appropriate work is shown, but the negative root is not rejected.
or [1] A correct equation is written, but no further correct work is shown.
or [1] An incorrect equation of equal difficulty is solved appropriately.
or [1] 6, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[13]

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[2] 1.5 and a correct diagram is drawn, and appropriate work is shown.
[1] Appropriate work is shown and a correct answer is found, but an incorrect diagram is drawn.
or [1] A correct diagram is drawn, but no further correct work is shown.
or [1] An incorrect diagram is drawn, but an appropriate answer is found.
or [1] 1.5, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[14]

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[2] $\sqrt{171}$ or 13 or 13.1 or 13.08 or an equivalent answer, and appropriate work is shown, such as the use of the equation of a circle $(x^2 + y^2 = r^2)$ or the Pythagorean theorem.
[1] Appropriate work is shown, but one computational error is made.
or [1] Incorrect analysis is shown, such as $x = 5$ and $y = 14$, but the work is concluded appropriately.
or [1] A correct answer is found, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[15]
