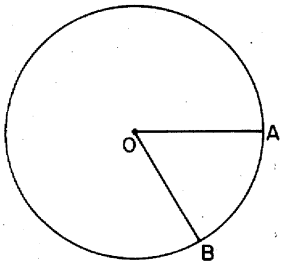
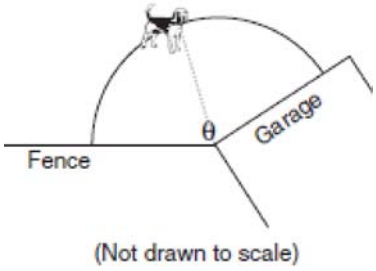
A2.A.61: Arc Length 2: Determine the length of an arc of a circle, given its radius and the measure of its central angle

1 In circle O, the length of radius $\overline{OB}$ is 5 centimeters and the length of $\overset{\frown}{AB}$ is 5 centimeters. The measure of $\angle AOB$ is



1) 1 radian
2) π radians
3) greater than 60°
4) 60°

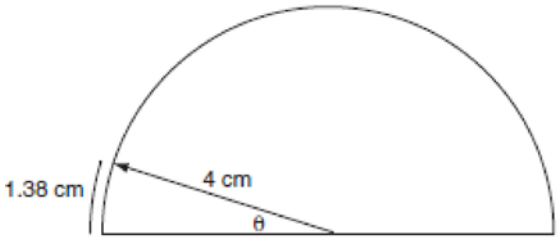
2 A dog has a 20-foot leash attached to the corner where a garage and a fence meet, as shown in the accompanying diagram. When the dog pulls the leash tight and walks from the fence to the garage, the arc the leash makes is 55.8 feet.



What is the measure of angle θ between the garage and the fence, in radians?
1) 0.36
2) 2.79
3) 3.14
4) 160

3 A wedge-shaped piece is cut from a circular pizza. The radius of the pizza is 6 inches. The rounded edge of the crust of the piece measures 4.2 inches. To the *nearest tenth,* the angle of the pointed end of the piece of pizza, in radians, is
1) 0.7
2) 1.4
3) 7.0
4) 25.2

4 As shown in the accompanying diagram, a dial in the shape of a semicircle has a radius of 4 centimeters. Find the measure of θ, in radians, when the pointer rotates to form an arc whose length is 1.38 centimeters.



5 In a circle, a central angle intercepts an arc of 12 centimeters. If the radius of the circle is 6 centimeters, find the number of radians in the measure of the central angle.

6 An arc of a circle measures 30 centimeters and the radius measures 10 centimeters. In radians, what is the measure of the central angle that subtends the arc?

Name: _____

7 In a circle with a radius of 4 centimeters, what is the number of radians in the central angle that intercepts an arc of 8 centimeters?

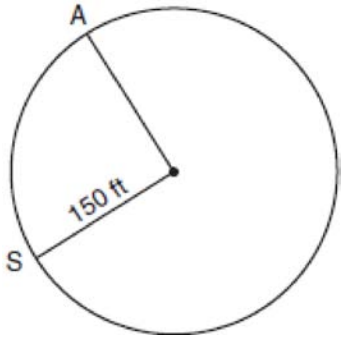
8 In a circle whose radius is 9 centimeters, what is the number of radians in a central angle if the length of the intercepted arc is 18 centimeters?

9 In a circle whose radius is 2, a central angle intercepts an arc whose length is 6. What is the number of radians in the central angle of the arc?

10 In a circle with a radius of 4 centimeters, what is the number of radians in a central angle that intercepts an arc of 24 centimeters?

11 In a circle whose radius is 5 centimeters, a central angle intercepts an arc of 10 centimeters. What is the number of radians in the central angle?

12 Kathy and Tami are at point *A* on a circular track that has a radius of 150 feet, as shown in the accompanying diagram. They run counterclockwise along the track from *A* to *S*, a distance of 247 feet. Find, to the *nearest degree*, the measure of minor arc *AS*.



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Answer Section

1 ANS: 1 PTS: 2 REF: 068422siii

2 ANS: 2

$\theta = \frac{s}{r} = \frac{55.8}{20} = 2.79$

PTS: 2 REF: 080309b

3 ANS: 1

$\theta = \frac{s}{r} = \frac{4.2}{6} = 0.7$

PTS: 2 REF: 080116b

4 ANS:

0.345. $\theta = \frac{s}{r} = \frac{1.38}{4} = 0.345$ radians

PTS: 2 REF: 010725b

5 ANS:
2

PTS: 2 REF: 089508siii

6 ANS:
3

PTS: 2 REF: 019615siii

7 ANS:
2

PTS: 2 REF: 019713siii

8 ANS:
2

PTS: 2 REF: 069811siii

9 ANS:
3

PTS: 2 REF: 080108siii

10 ANS:
6

PTS: 2 REF: 010207siii

11 ANS:
2

PTS: 2 REF: 010316siii

12 ANS:
94. $\theta = \frac{s}{r} = \frac{247}{150}$ radians. $\frac{247}{150} \cdot \frac{180}{\pi} \approx 94°$.

PTS: 4 REF: 060531b