Name: _____

CC Geometry

Area, Perimeter and Sectors Test Review

1) In a circle whose radius is 30, what is the length of an arc (in terms of π) which contains $100°$?

A) 8.3π C) 250π

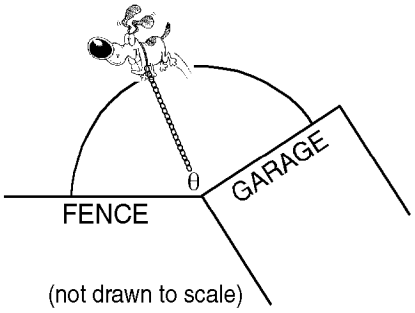
B) 16.7π D) 11.1π

2) In a circle whose radius is 8, the length of an arc of the circle is 2π. What is the number of radians in the central angle subtended by the arc?

A) 4π C) $\frac{\pi}{4}$

B) $\frac{\pi}{2}$ D) 16π

3) 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?

A) 160 C) 3.14

B) 2.79 D) 0.36

4) In a circle whose radius is 12, what is the area of a sector, in terms of π, whose central angle contains $60°$?

A) 8π C) 12π

B) 4π D) 24π

5) In a circle whose radius is 12, what is the measure of the central angle of a sector whose area is 8π?

A) $20°$ C) $120°$

B) $40°$ D) $200°$

6) What is the radius of a circle whose circumference is 18π?

A) 9 C) 12

B) 4.5 D) 18

7) The circumference of a circle is 20π. What is the area of the circle?

A) 20π C) 400π

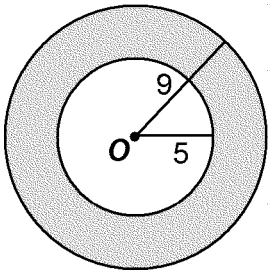
B) 100π D) 10π

8) A designer needs to create perfectly circular necklaces. The necklaces each need to have a radius of 10 cm. What is the *largest* number of necklaces that can be made from 1,000 cm of wire?

A) 32 C) 15

B) 16 D) 31

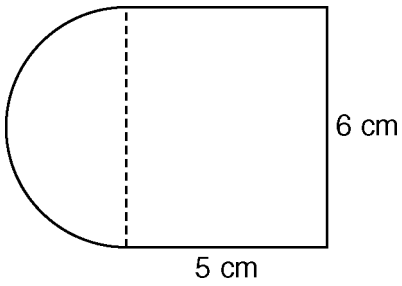
9) In the accompanying diagram, two concentric circles have radii of 9 and 5, respectively.



In terms of π, the area of the shaded region is

A) 4π
C) 16π
B) 56π
D) 8π

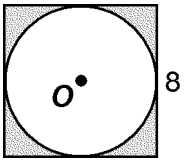
10) A figure is made up of a rectangle and a semicircle as shown in the diagram below.



What is the area of the figure, to the nearest tenth of a square centimeter?

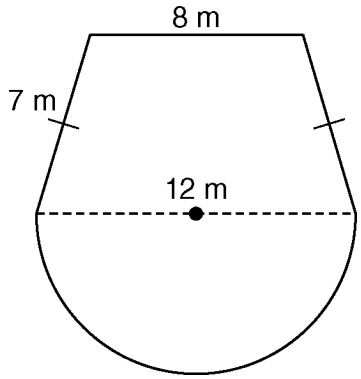
A) 44.1
C) 39.4
B) 58.3
D) 48.8

11) What is the area of the shaded region of the figure below when the side of the square is 8?



A) $64 - 16\pi$
C) $64 - 8\pi$
B) $32 - 8\pi$
D) $32 - 16\pi$

12) A garden is in the shape of an isosceles trapezoid and a semicircle, as shown in the diagram below. A fence will be put around the perimeter of the entire garden.



Which one of the following expressions represents the length of fencing, in meters, that will be needed?

A) $22 + 12\pi$
C) $15 + 12\pi$
B) $15 + 6\pi$
D) $22 + 6\pi$

13) If the area of a circle is 64π, the circumference of the circle is

A) 16
C) 8
B) 16π
D) 8π

14) Convert 40° to radian measure and express the answer in terms of π. [*Show all work.*]

15) Convert 216° to radian measure and express the answer in terms of π. [*Show all work.*]

16) Find the length of the arc on a circle with a radius of 2.4 kilometers and is intercepted by a central angle measuring $150°$. [*Answer may be expressed in terms of* π.]

17) Find the length of the arc on a circle with a radius of 6 yards and is intercepted by a central angle measuring $270°$. [*Answer may be expressed in terms of* π.]

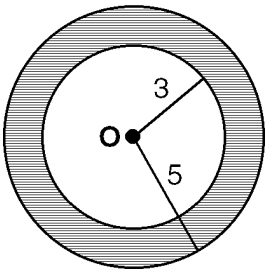
18) Find the length of the arc on a circle with a radius of 8 centimeters and is intercepted by a central angle measuring $\frac{7\pi}{4}$ radians. [*Answer may be expressed in terms of* π.]

19) What is the length of the arc that subtends a central angle of 2.3 radians in a circle of radius 7 centimeters?

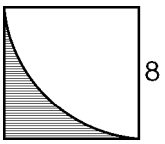
Questions 20 and 21 refer to the following:

Find the area of the shaded region of the given figure to the nearest whole number. [*Show all work*.]

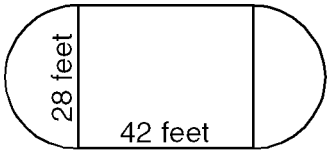
20)



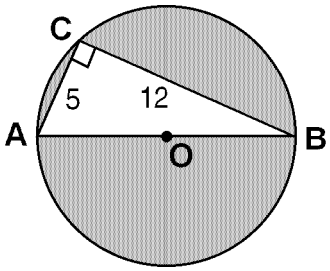
21)



22) A training ring for horses is an oval formed from a rectangle with two semicircles on either end. Rounded to the nearest foot, how many feet of fencing is required to surround the entire ring with a fence?

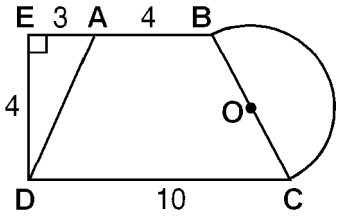


23) In the accompanying diagram, triangle ABC is inscribed in circle O, $\angle ACB$ is a right angle, $\overline{AB}$ is a diameter, $AC = 5$, and $BC = 12$.



Find the area of the shaded region to the nearest tenth. [*Show all work*.]

24) In the accompanying diagram, $ABCD$ is an isosceles trapezoid with bases $\overline{AB}$ and $\overline{CD}$, $\overline{BA}$ is extended to E, and $\overline{DE} \perp \overline{EB}$. Side $\overline{BC}$ is a diameter of semicircle O, $AB = 4$, $AE = 3$, $DE = 4$, and $DC = 10$.



(**a**) Find the length of $\overline{AD}$.

(**b**) Find the area of the entire figure to the nearest integer.

1) B 2) C 3) B 4) D 5) A

6) A 7) B 8) C 9) B 10) A

11) A 12) D 13) B

14) $\frac{2\pi}{9}$ radians

WORK SHOWN: $40(\frac{\pi}{180}) = \frac{40\pi}{180} = \frac{2\pi}{9}$

15) $\frac{6\pi}{5}$ radians

WORK SHOWN: $216(\frac{\pi}{180}) = \frac{6\pi}{5}$

16) 2π km

17) 9π yd

18) 14π cm

19) 16.1 cm

20) 50

WORK SHOWN: Area of shaded region = area of large circle − area of small circle; $(A = \pi r^2) - (A = \pi r^2) = \pi(5)^2 - \pi(3)^2 = 25\pi - 9\pi = 78.5 - 28.3 = 50.3 \approx 50$

21) 14

WORK SHOWN: Area of shaded region = area of square − $\frac{1}{4}$(area of circle); $(A = s^2) - \frac{1}{4}(A = \pi r^2) = (8)^2 - \frac{1}{4}((8)^2\pi) = 64 - \frac{1}{4}(64) = 64 - 16\pi = 64 - 50.3 = 13.7 \approx 14$

22) 172 feet

23) 102.7

WORK SHOWN: Area of shaded region = area of circle O − area of $\triangle ABC$; $a^2 + b^2 = c^2$, $(12)^2 + (5)^2 = c^2$, $144 + 25 = c^2$, $c^2 = 169$, $c = \sqrt{169} = 13$; Since $AB = c$ = diameter = 13, radius = $\frac{1}{2}(d) = \frac{1}{2}(13) = 6.5$; $(A = \pi r^2) - (A = \frac{1}{2}bh)$, $(6.5)^2\pi - \frac{1}{2}(5)(12) = 42.25\pi - \frac{1}{2}(60) = 132.73 - 30 = 102.73 \approx 102.7$

24) (a) 5; (b) 44