LESSON 4

Circles

Use with *Student Book* pp. 100–101

MATH CONTENT TOPICS: Q.2.a, Q.2.e, Q.4.b, A.2.a, A.2.b, A.2.c
MATH PRACTICES: MP.1.a, MP.1.b, MP.1.d, MP.1.e, MP.2.c, MP.4.a, MP.4.b

1 Review the Skill

A **circle** is a closed figure with no sides or corners. All points on a circle are equidistant from the center. The distance from the center of a circle to any point on the circle is called the **radius**. The **diameter** is the distance across a circle through its center. The diameter is always twice the radius. The distance around a circle is known as its **circumference**.

To find a circle's circumference, use the formula $C = \pi d$. To find a circle's area, use the formula $A = \pi r^2$. You may find a circle's circumference or area if you know either its radius or its diameter. If you know the radius of a circle, you may double it to find the diameter. If you know the diameter of a circle, you may divide it by 2 to find the radius.

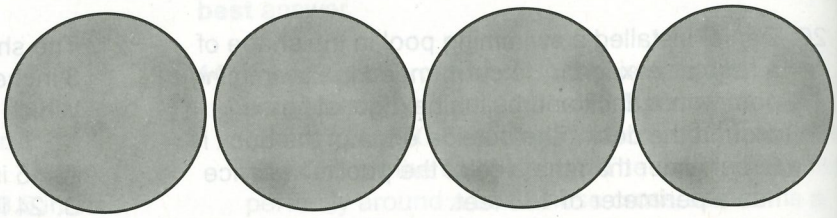
2 Refine the Skill

By refining the skills of finding the circumference and area of a circle, you will improve your study and test-taking abilities, especially as they relate to the GED® Mathematical Reasoning Test. Study the information below. Then answer the questions that follow.

a For both questions, you know the circumference and want to find the diameter. Use the formula for circumference and then work backward.

b Note that the information provided is in *inches*. For question 2, multiply the number of stones by the diameter of a stone. Then divide by 12 (inches in a foot) to find the number of *feet*.

Elizabeth created a path through her garden with identical round paving stones like those shown below. The circumference of each stone is 25.9 inches.



1. What is the approximate diameter of each stone in inches?

   A. 2.87
   B. 4.13
   C. 6.48
   D. 8.25

b 2. If Elizabeth uses 35 stones, about how many feet long will her garden path be?

   A. 24
   B. 76
   C. 92
   D. 289

CONTENT TOPICS

Content Topic Q.4.a states that students must "compute the area and circumference of circles." In so doing, they should determine the radius or diameter when given the area or circumference.

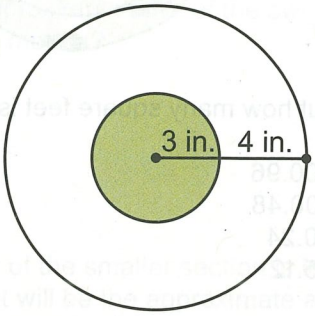
UNIT 4

3 Master the Skill

Spotlighted Item: FILL-IN-THE-BLANK

DIRECTIONS: Study the information and diagram below, read each question, and then fill in your answer in the box.

The circles below have the same center. The radius of the smaller circle is 3 inches. The radius of the larger circle is 7 inches.



3. What is the approximate circumference of the smaller circle?

_____ inches

4. What is the approximate circumference of the larger circle?

_____ inches

DIRECTIONS: Read each question, and fill in your answer in the box below.

5. A birdbath has a diameter of 30 inches. What is the approximate circumference of the birdbath in inches?

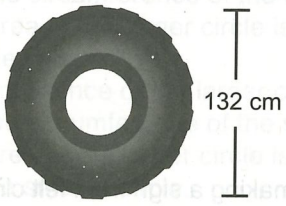
6. Linda is cutting circle shapes for a bulletin board. If she wants to cut a circle that has a circumference of 25.12 inches, what should the radius of the circle be in inches?

7. Jenna's sports bottle has an approximate circumference of 19 inches. What is the diameter of the sports bottle to the nearest inch?

_____ inches

DIRECTIONS: Read each question, and choose the **best** answer.

8. Lydia is using a tire to build a sandbox. She is cutting plywood to use as a cover for the sandbox.



About how many square centimeters of plywood does Lydia need to cover the sandbox?

A. 414
B. 828
C. 13,678
D. 54,711

9. Mr. Dunn is painting a large circle in the middle of a gymnasium. The diameter of the circle is 12 feet. What is the approximate area of the circle?

A. 18.84 ft²
B. 37.68 ft²
C. 75.36 ft²
D. 113.04 ft²

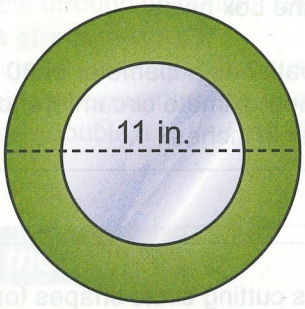
10. What is the radius of a circle that has a circumference of 50.24 inches?

A. 8 inches
B. 16 inches
C. 20 inches
D. 32 inches

3 Master the Skill

DIRECTIONS: Study the information and diagram, read each question, and choose the **best** answer.

The circular mirror below has a frame that is 2 inches wide. The diameter of the mirror and frame together is 11 inches.



11. What is the radius of the mirror without the frame?

A. 3.5 in.
B. 4.5 in.
C. 7 in.
D. 9 in.

12. What is the area of the mirror only in square inches?

A. 34.5
B. 38.5
C. 40.8
D. 95.0

13. What is the area of the frame only to the nearest tenth of square inch?

A. 151.5
B. 95.0
C. 56.5
D. 12.6

14. What is the approximate circumference of the mirror with the frame?

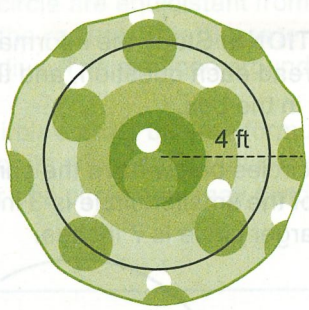
A. 34.54
B. 35.64
C. 47.10
D. 94.99

15. The area of a second mirror is 1.5 times the area of the mirror alone described above. About what is the diameter of the second mirror?

A. 4.3 inches
B. 8.6 inches
C. 12 inches
D. 17.5 inches

DIRECTIONS: Study the information and diagram below, read each question, and choose the **best** answer.

A circular tablecloth is shown in the diagram below.



16. About how many square feet is the tablecloth?

A. 200.96
B. 100.48
C. 50.24
D. 25.12

17. Tomas places the tablecloth on a circular table that has a diameter of 6 feet. About how many square feet of the tablecloth will hang over the edge of the table?

A. 12.56
B. 21.98
C. 50.24
D. 78.50

DIRECTIONS: Read each question, and choose the **best** answer.

18. Jonna is sewing a front cover for a circular pillow. The pillow has a diameter of 15 inches. To sew the front cover, she must cut the fabric two inches wider than the pillow all the way around. What is the minimum area, in square inches, of the piece of fabric she will use?

A. 706.5
B. 283.4
C. 226.9
D. 95.0

19. Carol is making a sign from felt circles that she will tie together in a row. One circle has a circumference of 37.68 inches. How many circles will she need to tie together to have a banner that is 60 inches long?

A. 2
B. 3
C. 4
D. 5

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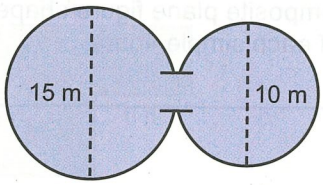
DIRECTIONS: Study the information and diagram, read each question, and choose the **best** answer.

A hotel swimming pool is in the shape of a sideways number eight.



20. What is the approximate area of the swimming pool in square meters?

A. 78
B. 255
C. 471
D. 1,019

21. If the diameter of the smaller section is increased by 45 cm, what will be the approximate area of the entire enlarged pool?

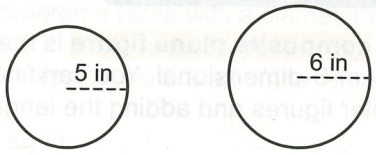
A. 79.90 square meters
B. 255.57 square meters
C. 262.35 square meters
D. 269.89 square meters

DIRECTIONS: Read each question, and choose the **best** answer.

22. A large circle has a radius of 6 meters. A smaller circle has a radius of 2 meters. Which statement is correct?

A. The circumference of the larger circle is 3 times the circumference of the smaller circle, and the area of the larger circle is 3 times the area of the smaller circle.
B. The circumference of the larger circle is 3 times the circumference of the smaller circle, and the area of the larger circle is 9 times the area of the smaller circle.
C. The circumference of the larger circle is 9 times the circumference of the smaller circle, and the area of the larger circle is 3 times the area of the smaller circle.
D. The circumference of the larger circle is 9 times the circumference of the smaller circle, and the area of the larger circle is 9 times the area of the smaller circle.

23. What is the approximate difference in square inches between the two circles?



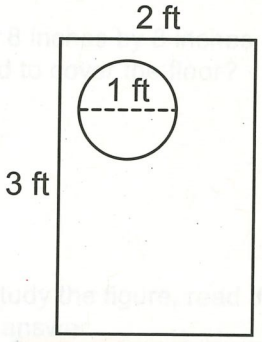
A. 1.0
B. 3.14
C. 6.28
D. 34.54

24. Dillon is building a model airplane. The front tires each have a diameter of 3.5 inches. What is the total circumference of the two tires to the nearest whole number?

A. 7 in.
B. 11 in.
C. 20 in.
D. 22 in.

DIRECTIONS: Study the information and diagram, read each question, and choose the **best** answer.

Ava hung a circular sunshield in a window in her living room to block the afternoon sun.



25. What is the approximate area of the sunshield in square feet?

A. 3.14
B. 1.57
C. 1.0
D. 0.79

26. About what percent of the area of her window is covered by the sunshield?

A. 13%
B. 16%
C. 17%
D. 50%

UNIT 4