

Circles: Circumference and Area Made Clear

Grade 7 math · Test · Standards: 7.G.B.4

Name: _____ Date: _____ Class: _____

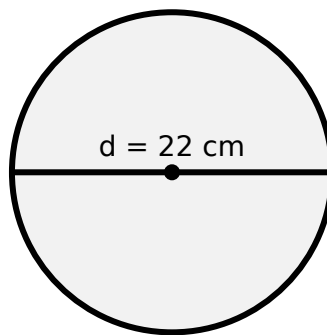
Circumference, area, semicircles and rearranged-sector reasoning are tested in 8 questions worth 20 points. Allow 45 minutes, show every step, and use 3.14 for π only when a question says so. Include units in each answer.

Standards: 7.G.B.4 · **Level:** Grade 7

Time: 45 minutes · 8 questions · Total: 20 points · Calculator: as allowed by your teacher

Question 1 Circumference and radius (2 points)

The circle shown has a diameter of 22 cm.



A circle with diameter 22 cm.

- Find the radius. (1 point)
- Write the circumference using π . (1 point)

Question 2 Area of a circle (2 points)

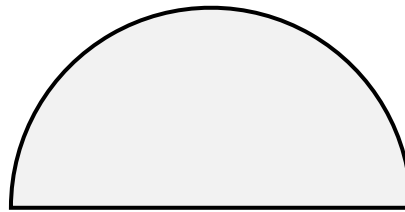
Calculate the area of a disk of radius 15 in. Let $\pi = 3.14$.

Question 3 Area from the circumference (3 points)

The distance around a circle is 50.24 m. Calculate the diameter, the radius and the area. Let $\pi = 3.14$.

Question 4 Semicircle (2 points)

The shape shown is a semicircle with a diameter of 20 cm. Let $\pi = 3.14$.



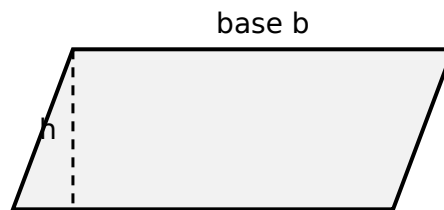
20 cm

A semicircle with diameter 20 cm.

- a. Calculate its area. (1 point)
- b. Find its perimeter, including the straight edge. (1 point)

Question 5 Explain the area formula (3 points)

A circle has a radius of 6 in. It is cut into thin sectors that are rearranged into a shape close to a parallelogram with base b and height h .



The rearranged shape for a circle of radius 6 in.

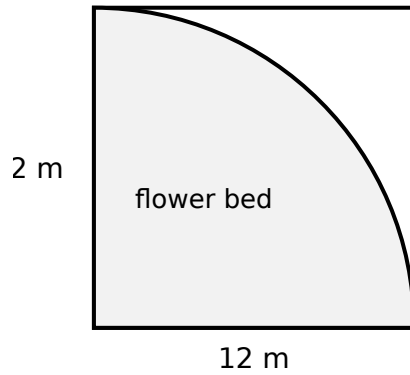
- a. Find b . Give the exact value. (1 point)
- b. Find h . (1 point)
- c. Use b and h to find the area in terms of π . (1 point)

Question 6 Wheel distance (2 points)

A wheel has a diameter of 20 in. How many feet does it roll in 300 complete turns? Let $\pi = 3.14$.

Question 7 Flower bed (3 points)

A square lawn is 12 m on each side. A quarter-circle flower bed with a radius of 12 m is in one corner, as shown. Let $\pi = 3.14$.



Square lawn with a quarter-circle flower bed.

- Calculate the flower bed area. (2 points)
- Calculate the lawn area that is not part of the flower bed. (1 point)

Question 8 Compare two circles (3 points)

Circle A has a radius of 5 ft and Circle B has a radius of 10 ft.

- Write each circumference in terms of π . (1 point)
- Write each area in terms of π . (1 point)
- Compare the area of Circle B with the area of Circle A. (1 point)