



Circumference and area of circles

Mana Maths

Te reo Māori terms



porowhita

circle

Open in Te Aka

taiāwhiotanga

circumference

Open in Te Aka

pūtoro

radius

Open in Te Aka

whitianga

diameter

Open in Te Aka

Circumference and area of circles — Foundation

1. A circle has radius 4 cm. What is its diameter?
2. A circle has diameter 12 m. What is its radius?
3. Find the circumference of a circle with radius 7 cm. Use $\pi \approx 3.14$.
4. Find the circumference of a circle with diameter 10 m. Use $\pi \approx 3.14$.
5. Find the area of a circle with radius 5 cm. Use $\pi \approx 3.14$.
6. Find the area of a circle with diameter 14 m. Use $\pi \approx 3.14$.
7. A circular pond has radius 3 m. What is its circumference?
8. A circular table has diameter 1.2 m. What is its area?
9. Which is larger: a circle with radius 6 cm or a circle with diameter 11 cm?

10. A circle has circumference 31.4 cm. What is its radius? (Use $\pi \approx 3.14$)

11. A circle has area 78.5 cm^2 . What is its radius? (Use $\pi \approx 3.14$)

12. Find the circumference of a semicircle with radius 8 cm.

13. Find the area of a quarter circle with radius 10 cm.

14. A bicycle wheel has diameter 70 cm. How far does it travel in one revolution?

Circumference and area of circles — Proficient

1. Find the circumference of a circle with radius 4.5 cm. Give your answer in terms of π .

2. Find the area of a circle with diameter 18 m. Give your answer in terms of π .

3. A circular garden has circumference 25.12 m. What is its radius? (Use $\pi \approx 3.14$)

4. A circular pizza has area 154 cm^2 . What is its diameter? (Use $\pi \approx \frac{22}{7}$)

5. Which has larger area: a circle with radius 8 cm or a circle with circumference 50 cm?

6. A semicircle has diameter 20 cm. Find its perimeter (including the straight edge).

7. A quarter circle has radius 12 m. Find its area.

8. A bicycle wheel has radius 35 cm. How many complete revolutions does it make over 1 km?

9. Two circles have radii in the ratio 3:4. What is the ratio of their circumferences?

10. Two circles have radii in the ratio 2:5. What is the ratio of their areas?

11. A circular running track has inner radius 30 m and outer radius 35 m. Find the area of the track.

12. Find the perimeter of a shape made from a semicircle of radius 7 cm on top of a rectangle 14 cm by 7 cm.

Circumference and area of circles — Excellence

1. A circle's area is 36π cm^2 . Find its circumference in terms of π .
2. A circle's circumference is 20π m. Find its area in terms of π .
3. The area of a circle is increased by 44%. By what percentage does its radius increase?
4. The circumference of a circle is tripled. By what factor does its area increase?
5. A square and a circle have the same perimeter. If the square has side length 11 cm, find the area of the circle.
6. A rectangle has length 12 cm and width equal to the diameter of a circle with area 25π cm^2 . Find the rectangle's perimeter.

- 7.** Find the area of the shaded region when a circle of radius 10 cm has a square of side length 14 cm inscribed in it.
- 8.** Four semicircles of diameter 8 cm are arranged to form a shape. Find the total perimeter of the shape.
- 9.** A circular sector has radius 15 cm and central angle 72° . Find its arc length and area.
- 10.** Two concentric circles have radii 7 cm and 10 cm. Find the area of the annulus (ring) between them.
- 11.** A wire is bent to form a circle of radius 21 cm. The same wire is then bent to form a square. Find the area of the square.
- 12.** A circular flower bed has circumference 31.4 m. A path 1 m wide is built around it. Find the area of the path.

- 13.** The ratio of the areas of two circles is 9:16. If the smaller circle has circumference 18π cm, find the radius of the larger circle.
- 14.** A running track consists of two straight sections each 100 m long and two semicircular ends. If the total length of the track is 400 m, find the area enclosed by the track.
- 15.** A circle is inscribed in a square of side length 14 cm. Find the area of the region outside the circle but inside the square.
- 16.** A goat is tied to a corner of a square shed with side length 10 m. The rope is 15 m long. Find the area the goat can graze (outside the shed).
- 17.** Find the radius of a circle whose area is equal to the sum of the areas of two circles with radii 6 cm and 8 cm.
- 18.** A circular pizza is cut into 8 equal slices. If the diameter is 40 cm, find the perimeter of one slice (including the two straight edges).

19. The minute hand of a clock is 12 cm long. Find the area swept by the minute hand in 25 minutes.

20. A circular pond has diameter 8 m. A concrete path 2 m wide is built around it. Find the cost of concreting the path at \$45 per m^2 .