

Circles

KS3 Maths · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

Find the circumference and area of a circle with radius 4cm. ($\pi = 3.14$)

Step 1 · Circumference: $C = 2\pi r$

$$2 \times 3.14 \times 4 = 25.12\text{cm}$$

Step 2 · Area: $A = \pi r^2$

$$3.14 \times 4^2 = 3.14 \times 16 = 50.24\text{cm}^2$$

Answer: $C = 25.12\text{cm}$, $A = 50.24\text{cm}^2$

Check: Both use the same radius — circumference is linear (cm), area is squared (cm^2) ✓

2. Now try one with the steps

Find the area of a circle with diameter 10 cm. ($\pi = 3.14$)

Step 1 · Area needs the radius, so halve the diameter

Step 2 · Square the radius

Step 3 · Multiply by π

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Find the circumference of a circle with radius 7cm. (Use $\pi = 3.14$) [2]

2. Find the area of a circle with radius 5cm. (Use $\pi = 3.14$) [2]

3. A circle has a diameter of 12cm. Find its circumference. (Use $\pi = 3.14$) [2]

4. A circle has area 50.24cm^2 . Find its radius. (Use $\pi = 3.14$) [3]

5. Find the area of a semicircle with radius 6cm. (Use $\pi = 3.14$) [3]

6. A circular garden has circumference 31.4m. Find its area. (Use $\pi = 3.14$) [4]

7. A circle has a radius of 9 cm. What is its diameter? [1]

8. A circle has a diameter of 15 cm. What is its radius? [1]

9. Find the circumference of a circle with diameter 10 cm. (Use $\pi = 3.14$) [1]

10. Find the area of a circle with radius 10 cm. (Use $\pi = 3.14$) [2]

11. Find the area of a circle with diameter 8 cm. (Use $\pi = 3.14$) [2]

12. Find the circumference of a circle with radius 3 cm. Leave your answer in terms of π . [1]

13. Find the area of a circle with radius 7 cm. Leave your answer in terms of π . [1]

14. A circle has a circumference of 62.8 cm. Find its diameter. (Use $\pi = 3.14$) [2]

15. A bicycle wheel has a diameter of 70 cm. How far does the bike move in one full turn of the wheel? [2]
Use the π button and give your answer to the nearest cm.

16. How many complete turns does that 70 cm wheel make in 1 km? [3]

4. Before you hand it in

Using the diameter instead of the radius in $A=\pi r^2$

Always check: are you given the radius or the diameter? If given diameter, halve it first to get the radius before squaring for area. $C=\pi d$ works directly with diameter, but $A=\pi r^2$ needs the radius.

Squaring $2\pi r$ instead of just r when finding area

Area = πr^2 — only the radius is squared, not the whole circumference formula. Keep the two formulas ($C=2\pi r$ and $A=\pi r^2$) clearly separate.

Working out πr^2 as $(\pi \times r)^2$, e.g. $(3.14 \times 4)^2 = 157.8$

Only the radius is squared. Square first, then multiply: $4^2 = 16$, and $3.14 \times 16 = 50.24$. (Indices come before multiplication.)