

Foundation GCSE: Circumference of a Circle

Name: _____

Class: _____

Instructions: Answer all questions. Questions are ordered from easiest (1) to hardest (20). Working out should be shown where appropriate.

1. Calculate the circumference of a circle with a diameter of 10 cm. Give your answer in terms of π .
2. Calculate the circumference of a circle with a radius of 4 cm. Give your answer in terms of π .
3. Calculate the circumference of a circle with a diameter of 14 cm, using $\pi \approx \frac{22}{7}$.
4. Calculate the circumference of a circle with a radius of 6 cm, giving your answer to 1 decimal place (use $\pi \approx 3.14$).
5. Find the diameter of a circle with a circumference of 20π cm.
6. Find the radius of a circle with a circumference of 18π cm.
7. Calculate the perimeter of a semicircle with a diameter of 12 cm. Give your answer in terms of π .
8. Calculate the perimeter of a semicircle with a radius of 7 cm, using $\pi \approx \frac{22}{7}$.
9. A circular running track has a diameter of 50 m. Calculate the distance around the track, giving your answer to 1 decimal place (use $\pi \approx 3.14$).
10. A bicycle wheel has a radius of 35 cm. Calculate the distance the bicycle travels in one complete rotation of the wheel, using $\pi \approx \frac{22}{7}$.
11. Calculate the perimeter of a quarter-circle of radius 8 cm. Give your answer in terms of π .
12. A circular pond has a circumference of 31.4 m. Calculate its diameter, using $\pi \approx 3.14$.
13. A shape is made from a rectangle of length 10 cm attached to a semicircle on each end of width 6 cm. Calculate the total perimeter in terms of π .
14. A coin has a circumference of 7.85 cm. Calculate its radius to 1 decimal place, using $\pi \approx 3.14$.
15. A running track consists of two straight sections of length 50 m and two semicircular ends with a diameter of 30 m. Calculate the total perimeter to 1 decimal place, using $\pi \approx 3.14$.
16. A bicycle wheel of radius 40 cm rotates 500 times. Calculate the total distance traveled in metres to 1 decimal place, using $\pi \approx 3.14$.
17. A circular metal plate has a circumference of 44 cm (using $\pi \approx \frac{22}{7}$). It is cut from a square sheet of minimum possible size. Calculate the perimeter of the square sheet.
18. An arc of a circle subtends an angle of 90° at the centre, with a radius of 12 cm. Calculate the arc length in terms of π .
19. A composite shape consists of a square of side 10 cm with semicircles drawn outward on all four sides. Calculate the total perimeter in terms of π .
20. A wheel of diameter 60 cm rolls along the ground and makes 250 complete rotations. Calculate the total distance traveled in kilometres to 2 decimal places, using $\pi \approx 3.14$.

Answers & Worked Solutions

1. 10π cm : $C = \pi d = 10\pi$.
2. 8π cm : $C = 2\pi r = 2 \times \pi \times 4 = 8\pi$.
3. 44 cm : $C = \frac{22}{7} \times 14 = 44$.
4. 37.7 cm : $C = 2 \times 3.14 \times 6 = 37.68 \approx 37.7$.
5. 20 cm : $d = C \div \pi = 20\pi \div \pi = 20$.
6. 9 cm : $r = (18\pi \div \pi) \div 2 = 9$.
7. $(6\pi + 12)$ cm : Perimeter $= \frac{1}{2}(\pi \times 12) + 12 = 6\pi + 12$.
8. 36 cm : Perimeter $= \frac{1}{2} \times \frac{22}{7} \times 14 + 14 = 22 + 14 = 36$.
9. 157.0 m : $C = 3.14 \times 50 = 157.0$.
10. 220 cm : $C = 2 \times \frac{22}{7} \times 35 = 220$.
11. $(4\pi + 16)$ cm : $\frac{1}{4}(2 \times \pi \times 8) + 8 + 8 = 4\pi + 16$.
12. 10 m : $d = 31.4 \div 3.14 = 10$.
13. $(6\pi + 20)$ cm : Two semicircles make one full circle of diameter 6 (6π), plus two straight lengths of 10 (20). Total $= 6\pi + 20$.
14. 1.3 cm : $d = 7.85 \div 3.14 = 2.5$; $r = 2.5 \div 2 = 1.25 \approx 1.3$.
15. 194.2 m : Two straight lengths $= 50 + 50 = 100$; Two semicircles form one full circumference of diameter 30: $3.14 \times 30 = 94.2$; Total $= 100 + 94.2 = 194.2$.
16. 1256.0 m : $C = 2 \times 3.14 \times 0.4 = 2.512$ m; Distance $= 2.512 \times 500 = 1256.0$.
17. 56 cm : Diameter of circle $= 44 \div \frac{22}{7} = 14$ cm (side of square). Square perimeter $= 4 \times 14 = 56$.
18. 6π cm : $\frac{90}{360} \times (2 \times \pi \times 12) = \frac{1}{4} \times 24\pi = 6\pi$.
19. 20π cm : Four semicircles of diameter 10 combine to form two full circles of diameter 10; Perimeter $= 2 \times (\pi \times 10) = 20\pi$.
20. 0.47 km : $C = 3.14 \times 0.6 = 1.884$ m; Total distance $= 1.884 \times 250 = 471.0$ m $= 0.47$ km.