

Foundation GCSE: Surface Area

Name: _____

Class: _____

Instructions: Answer all questions. Questions are ordered from easiest (1) to hardest (15). Working out should be shown where appropriate.

1. Calculate the total surface area of a cube with side length 4 cm.
2. Calculate the total surface area of a cuboid measuring 6 cm by 5 cm by 3 cm.
3. A cylinder has a radius of 4 cm and a height of 10 cm. Calculate its total surface area, using $\pi \approx 3.14$, giving your answer to 1 decimal place.
4. Calculate the total surface area of a square-based pyramid with a base side of 6 cm and a triangular face slant height of 8 cm.
5. A solid hemisphere has a radius of 7 cm. Calculate its total surface area (including the flat circular base), using $\pi \approx \frac{22}{7}$.
6. A triangular prism has a length of 10 cm, and its cross-section is a right-angled triangle with sides 3 cm, 4 cm, and 5 cm. Calculate its total surface area.
7. A closed cylindrical metal tin has a diameter of 14 cm and a height of 20 cm. Calculate its total surface area, using $\pi \approx \frac{22}{7}$.
8. A cube has a total surface area of 150 cm^2 . Calculate its side length.
9. A sphere has a radius of 6 cm. Calculate its surface area ($A = 4\pi r^2$), using $\pi \approx 3.14$, giving your answer to 1 decimal place.
10. A cuboid water tank without a lid has dimensions 4 m long, 3 m wide, and 2 m high. Calculate its total exterior surface area.
11. A cone has a base radius of 5 cm and a slant height of 13 cm. Calculate its curved surface area (πrl), using $\pi \approx 3.14$.
12. A solid metal block is formed by joining two identical cubes of side 3 cm face-to-face. Calculate the total surface area of the new combined shape.
13. A pipe has an outer radius of 4 cm and a length of 50 cm. Calculate its outer curved surface area, using $\pi \approx 3.14$.
14. A regular tetrahedron has 4 faces, each being an equilateral triangle of area 12 cm^2 . Calculate its total surface area.
15. A composite shape is made of a cylinder of radius 3 cm and height 8 cm with a hemisphere of the same radius mounted on top. Calculate the total external surface area, using $\pi \approx 3.14$, giving your answer to 1 decimal place.

Answers & Worked Solutions

1. 96 cm^2 : Surface area $= 6 \times 4^2 = 96$.
2. 126 cm^2 : Surface area $= 2(6 \times 5 + 6 \times 3 + 5 \times 3) = 2(30 + 18 + 15) = 126$.
3. 351.7 cm^2 : Area $= 2\pi r^2 + 2\pi r h = 2(3.14)(16) + 2(3.14)(4)(10) = 100.48 + 251.2 = 351.68 \approx 351.7$.
4. 132 cm^2 : Base area $= 36$; Four triangles $= 4 \times (\frac{1}{2} \times 6 \times 8) = 96$; Total $= 36 + 96 = 132$.
5. 462 cm^2 : Curved area $= 2 \times \frac{22}{7} \times 49 = 308$;
Base area $= \frac{22}{7} \times 49 = 154$; Total $= 308 + 154 = 462$.
6. 132 cm^2 : Two triangular ends $= 2 \times (\frac{1}{2} \times 3 \times 4) = 12$; Three rectangles $= (3 + 4 + 5) \times 10 = 120$; Total $= 12 + 120 = 132$.
7. 1188 cm^2 : Radius $= 7$; Two ends $= 2 \times \frac{22}{7} \times 49 = 308$; Curved area $= \frac{22}{7} \times 14 \times 20 = 880$; Total $= 308 + 880 = 1188$.
8. 5 cm : Area per face $= 150 \div 6 = 25$; Side length $= \sqrt{25} = 5$.
9. 452.2 cm^2 : Surface area $= 4 \times 3.14 \times 6^2 = 452.16 \approx 452.2$.
10. 40 m^2 : Base $= 4 \times 3 = 12$; Four walls $= 2(4 \times 2) + 2(3 \times 2) = 16 + 12 = 28$; Total $= 12 + 28 = 40$.
11. 204.1 cm^2 : Curved area $= 3.14 \times 5 \times 13 = 204.1$.
12. 90 cm^2 : Two cubes $= 2 \times 54 = 108$; Minus 2 joined faces $(2 \times 9 = 18)$; Total $= 108 - 18 = 90$.
13. 1256 cm^2 : Curved area $= 2 \times 3.14 \times 4 \times 50 = 1256$.
14. 48 cm^2 : Total area $= 4 \times 12 = 48$.
15. 235.5 cm^2 : Cylinder curved area $= 2(3.14)(3)(8) = 150.72$; Cylinder bottom base $= 3.14(3^2) = 28.26$; Hemisphere curved area $= 2(3.14)(3^2) = 56.52$; Total $= 150.72 + 28.26 + 56.52 = 235.5$.