Surface area of composite solids

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. Two cubes of edge 3 cm share a whole face. Find the exposed area. [2 marks]

$2 \times 54 - 2 \times 9 = 90.$

Answer: 90 cm²

2. Two cubes of edge 4 cm share a whole face. Find the exposed area. [2 marks]

The result is an 8 by 4 by 4 cuboid.

$2(32 + 32 + 16) = 160.$

Answer: 160 cm²

3. Join 10 by 6 by 4 cm and 2 by 6 by 4 cm cuboids along their 6 by 4 faces. Find exposed area. [2 marks]

The result is 12 by 6 by 4.

$2(72 + 48 + 24) = 288.$

Answer: 288 cm²

4. A cube of edge 6 cm has a square-pyramid roof with triangular slant height 5 cm. Find exposed area; the square join is hidden. [3 marks]

Five cube faces:180.

Four roof triangles:$4 \times \frac{1}{2} \times 6 \times 5 = 60$.

$\text{Total} = 240$.

Answer: 240 cm²

5. A radius 2 cm, height 5 cm cylinder has a matching hemisphere on top and an exposed flat bottom. Find outside area. [2 marks]

Curved cylinder 20π; hemisphere 8π; base 4π.

Answer: $32\pi \text{ cm}^2$

6. A cube of edge 5 cm supports a square-pyramid roof of slant height 7 cm. Find exposed area. [3 marks]

Five square faces $= 125$.

Four roof faces $= 4 \times \frac{1}{2} \times 5 \times 7 = 70$.

$\text{Total} = 195$.

Answer: 195 cm²