Nets and surface area of right prisms

6 questions | 15 marks

Equivalent correct methods earn the corresponding marks.

1. Find the surface area of a closed rectangular prism 4 cm long, 3 cm wide and 2 cm high. [2 marks]

$2(4 \times 3 + 4 \times 2 + 3 \times 2) = 2(12 + 8 + 6) = 52$ cm².

Answer: 52 cm²

2. A cube has side length 5 cm. Find its total surface area. [2 marks]

Each square has area 25 cm². Six faces give $6 \times 25 = 150$ cm².

Answer: 150 cm²

3. A right triangular prism has perpendicular cross-section sides 6 cm and 8 cm, a third side 10 cm, and length 7 cm. Find its surface area. [3 marks]

Two ends: $2(\frac{1}{2} \times 6 \times 8) = 48$ cm².

Sides: $(6 + 8 + 10) \times 7 = 168$ cm². Total 216 cm².

Answer: 216 cm²

4. An open-top rectangular box is 8 cm long, 5 cm wide and 3 cm high. Find the material area, ignoring thickness. [3 marks]

Base $8 \times 5 = 40$; two long walls $2(8 \times 3) = 48$; two short walls $2(5 \times 3) = 30$.

Total $40 + 48 + 30 = 118$ cm².

Answer: 118 cm²

5. A closed rectangular prism has length 5 cm, width 4 cm and surface area 94 cm². Find its height. [3 marks]

$2(20 + 5h + 4h) = 94$. Thus $40 + 18h = 94$, so $18h = 54$ and $h = 3$ cm.

Answer: 3 cm

6. A right prism has cross-section area 24 cm², cross-section perimeter 20 cm and length 9 cm. Find its surface area. [2 marks]

$A = 2B + PL = 2(24) + 20(9) = 48 + 180 = 228$ cm².

Answer: 228 cm²