Perimeter, area and volume - topic test

15 questions | 39 marks | 45 minutes

A progressive handwritten paper on units, boundary, area, circle circumference, prisms, nets and views.

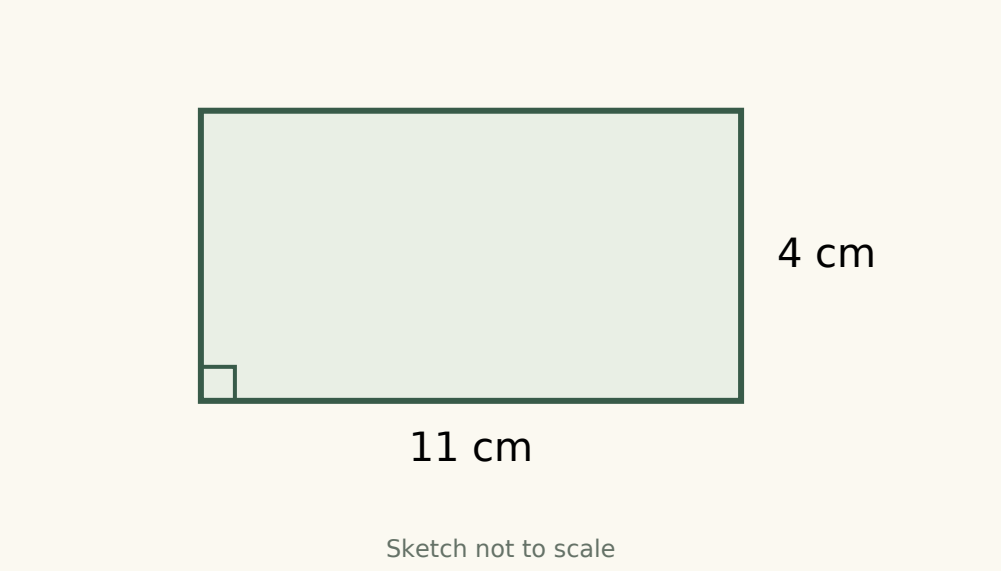
Equivalent correct methods earn the corresponding marks.

1. Convert 4.2 m to centimetres. [1 mark]

$4.2 \times 100 = 420$ cm.

Answer: 420 cm

2. Find the perimeter of a rectangle 11 cm by 4 cm. [2 marks]



$2(11 + 4) = 30$ cm.

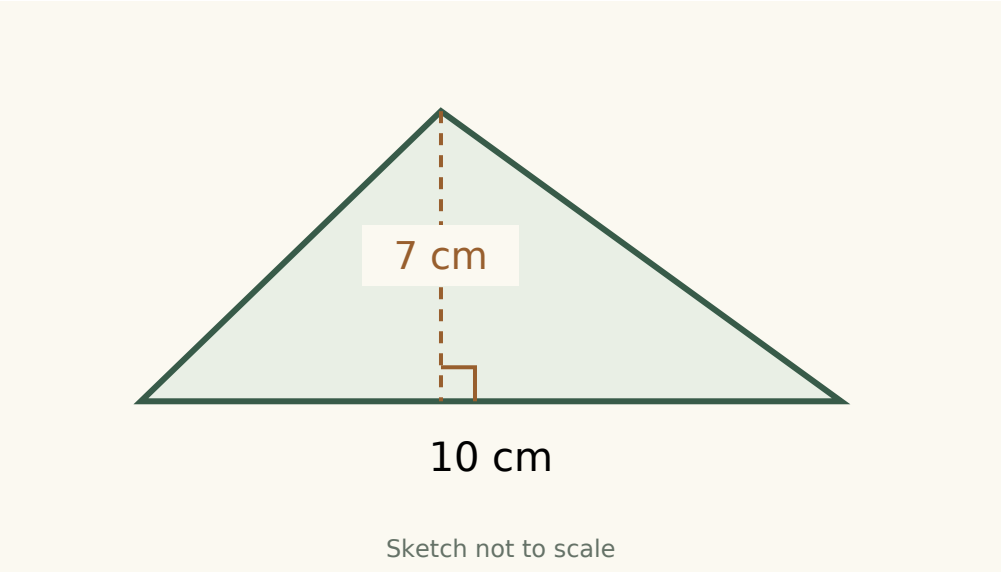
Answer: 30 cm

3. Find the area of a rectangle 8 m by 5 m. [1 mark]

$8 \times 5 = 40$ m².

Answer: 40 m²

4. A triangle has base 10 cm and perpendicular height 7 cm. Find its area. [2 marks]

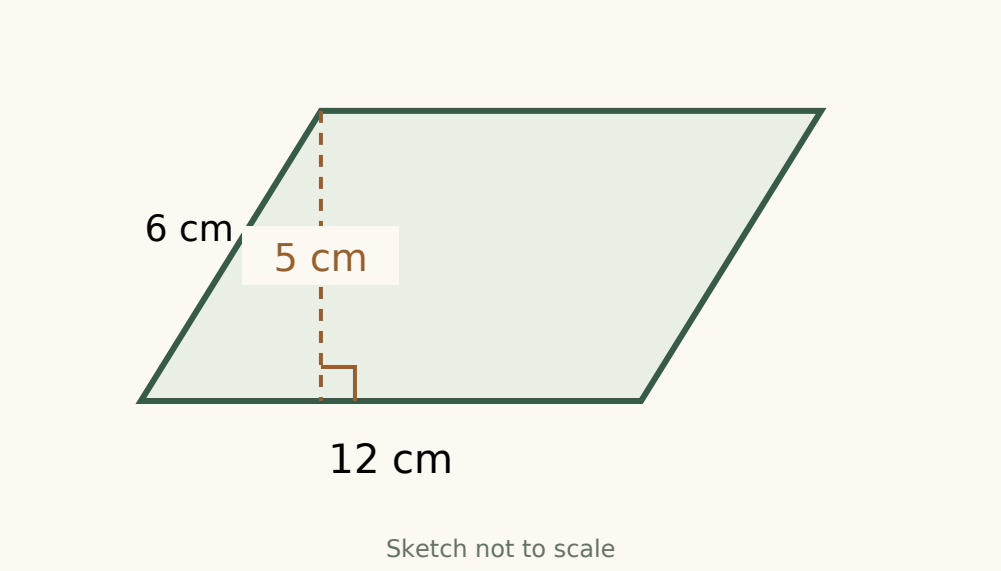


Sketch not to scale

$\frac{1}{2} \times 10 \times 7 = 35$ cm².

Answer: 35 cm²

5. The parallelogram has base 12 cm, perpendicular height 5 cm and sloping side 6 cm. Find its area. [2 marks]



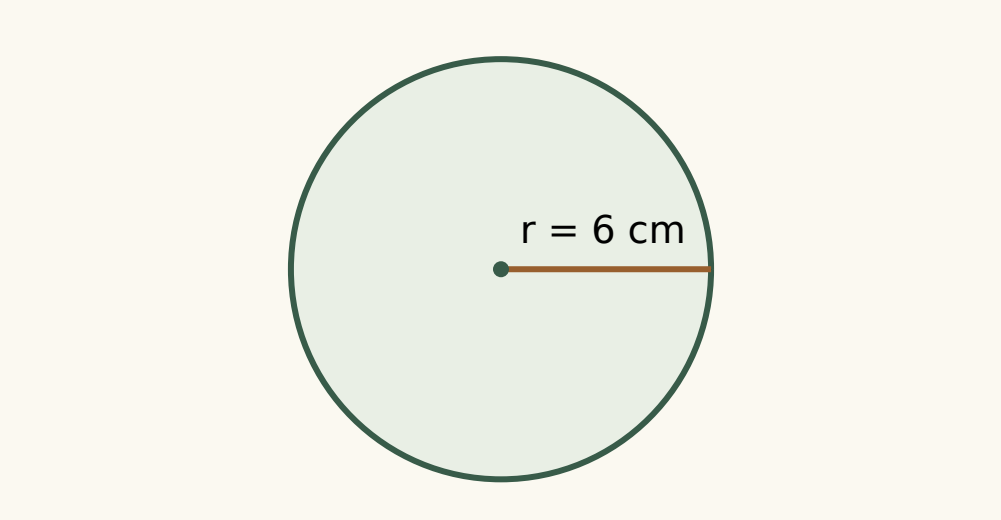
Sketch not to scale

Use the perpendicular height 5 cm.

$12 \times 5 = 60$ cm².

Answer: 60 cm²

6. For a circle of radius 6 cm, find the diameter and exact circumference. [3 marks]



(a) Find the diameter. [1 mark]

$2 \times 6 = 12$ cm.

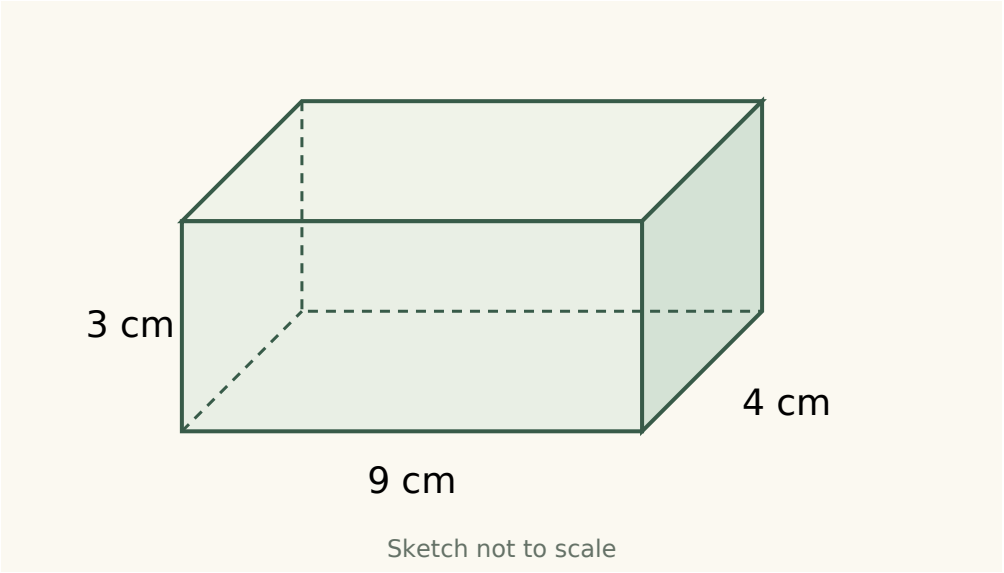
Answer: 12 cm

(b) Find the circumference exactly. [2 marks]

$C = \pi d = 12\pi$ cm.

Answer: 12π cm

7. Find the volume of a cuboid 9 cm by 4 cm by 3 cm. [2 marks]



Sketch not to scale

$9 \times 4 \times 3 = 108$ cm³.

Answer: 108 cm³

8. A bottle can hold 750 mL. Express this as a volume in cm³ and as a capacity in litres. [2 marks]

(a) Give the volume in cm³. [1 mark]

$1 \text{ mL} = 1 \text{ cm}^3$.

Answer: 750 cm³

(b) Give the capacity in litres. [1 mark]

$750 \div 1{,}000 = 0.75$.

Answer: 0.75 L

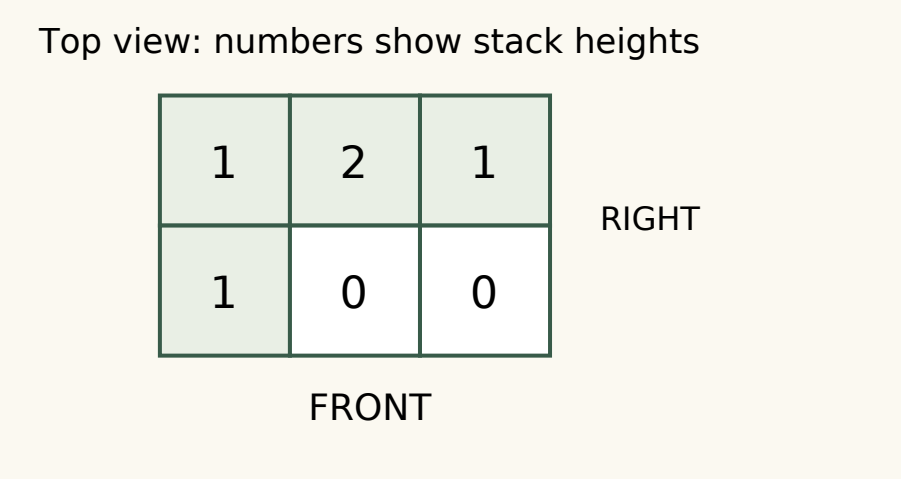
9. A cuboid is 8 cm by 5 cm by 2 cm. List the dimensions of its three pairs of opposite faces. [3 marks]

Each pair uses two edge lengths.

Opposite faces match.

Answer: Two 8×5 cm, two 8×2 cm, and two 5×2 cm faces.

10. The diagram is a plan of cube stacks. Find the total number of cubes and draw the front elevation. [4 marks]

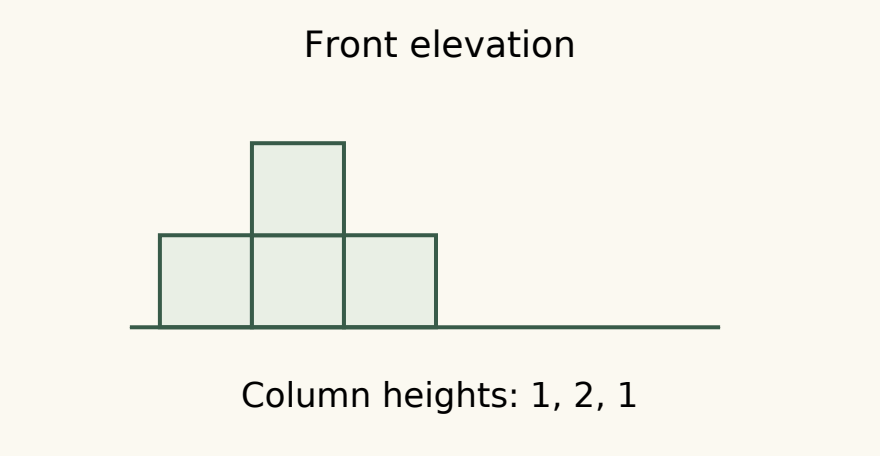


(a) How many cubes are there? [2 marks]

$1+2+1+1+0+0=5$.

Answer: 5

(b) Draw the front elevation and state the column heights. [2 marks]



Column maxima are 1, 2 and 1.

Answer: 1, 2, 1

11. A rectangle has perimeter 46 m and length 15 m. Find its width. [3 marks]

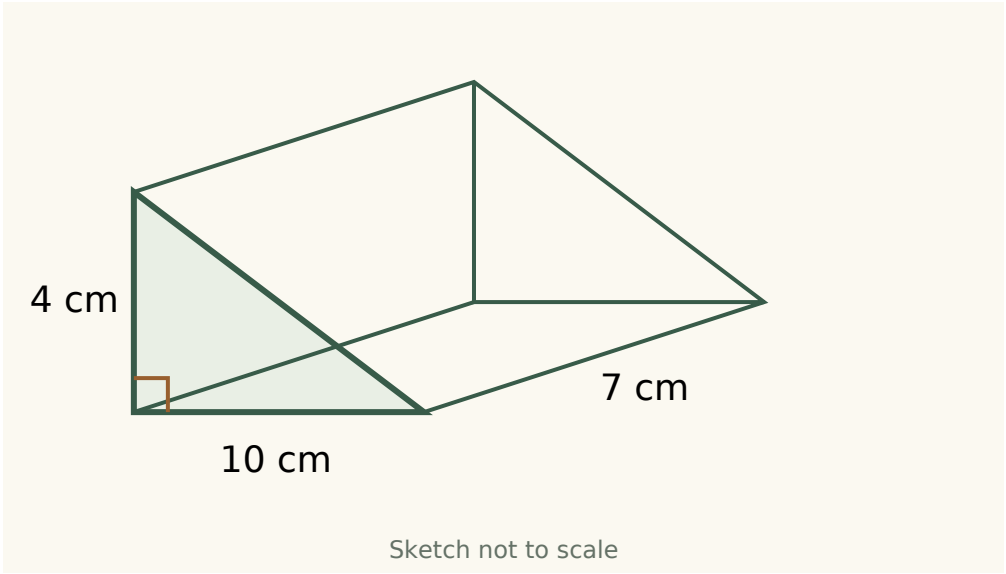
Two lengths total 30 m.

Two widths total $46 - 30 = 16$ m.

$\text{Width} = 16 \div 2 = 8$ m.

Answer: 8 m

12. Find the volume of the triangular prism. The end base is 10 cm, its perpendicular height is 4 cm, and the prism is 7 cm long. [3 marks]



Sketch not to scale

$\text{Triangle area} = \frac{1}{2} \times 10 \times 4 = 20$ cm².

$\text{Volume} = 20 \times 7 = 140$ cm³.

Answer: 140 cm³

13. A semicircular border has diameter 8 m. Find the complete perimeter exactly, including the straight side. [3 marks]

Full circle circumference is 8π m.

Half the curved boundary is 4π m.

Add the straight 8 m diameter.

Answer: $(4\pi + 8)$ m

14. A 14 m by 9 m rectangular garden has a 2 m gate. Find the fencing length and the garden area. [4 marks]

(a) How much fencing is needed? [2 marks]

$2(14+9)-2=44$ m.

Answer: 44 m

(b) What is the garden area? [2 marks]

$14\times 9=126$ m².

Answer: 126 m²

15. Two prisms have equal cross-section area. Prism A is 5 cm long and has volume 90 cm³. Prism B is 12 cm long. Find the cross-section area and volume of B. Explain why doubling the prism length while keeping its cross-section unchanged would double its volume. [4 marks]

(a) Find the common cross-section area. [1 mark]

$90\div 5=18$ cm².

Answer: 18 cm²

(b) Find the volume of B. [1 mark]

$18\times 12=216$ cm³.

Answer: 216 cm³

(c) Explain why doubling only the prism length, with its cross-section unchanged, doubles the volume. [2 marks]

$V=A\times \text{length}$.

For the same A, doubling length multiplies volume by 2.

Answer: It is true because cross-section area stays fixed.