EXERCISE 4D

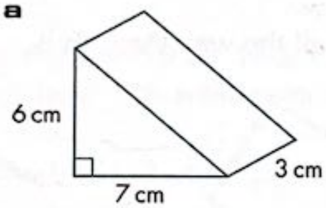
1 For each prism shown

i sketch the cross-section

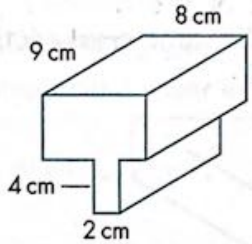
ii calculate the area of the cross-section

iii calculate the volume.

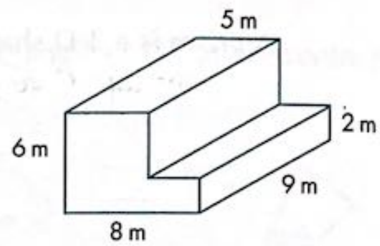
a



b

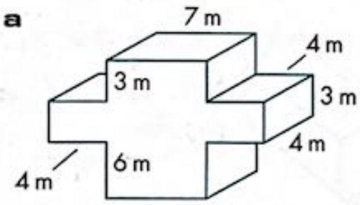


c

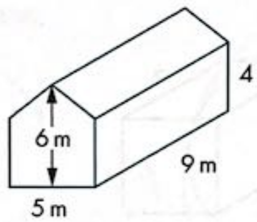


2 Calculate the volume of each of these prisms.

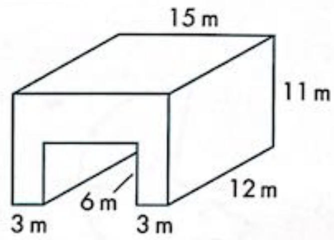
a



b

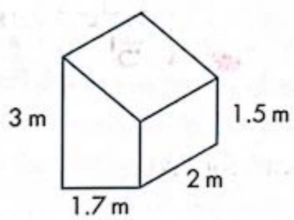


c



3 The uniform cross-section of a swimming pool is a trapezium with parallel sides, 1 m and 2.5 m, with a perpendicular distance of 30 m between them. The width of the pool is 10 m. How much water is in the pool when it is full? Give your answer in litres.

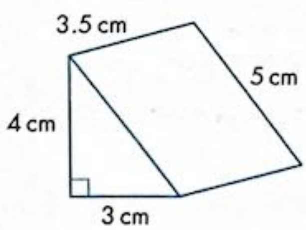
4 A lean-to is a prism. Calculate the volume of air inside the lean-to with the dimensions shown in the diagram. Give your answer in litres.

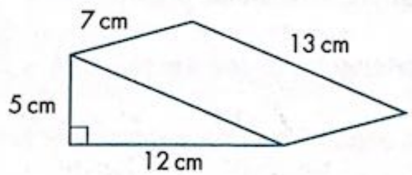


5 Each of these prisms has a regular cross-section in the shape of a right-angled triangle.

a Find the volume of each prism.

b Find the total surface area of each prism.

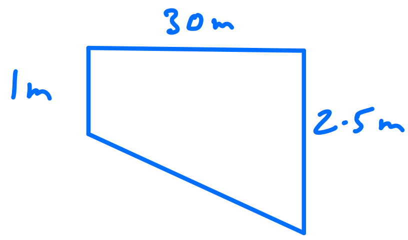




Homework for Friday 4 March

Q3, Q4, Q5 in small homework books

3 The uniform cross-section of a swimming pool is a trapezium with parallel sides, 1 m and 2.5 m, with a perpendicular distance of 30 m between them. The width of the pool is 10 m. How much water is in the pool when it is full? Give your answer in litres.



$$\text{Area} = \tfrac{1}{2}(1 + 2.5) \times 30$$
$$= 52.5 \text{ m}^2$$
$$\text{Volume} = 52.5 \times 10 = 525 \text{ m}^3$$

$1 \text{ metre}^3 = 1000$ litres

Water in pool 525,000 litres

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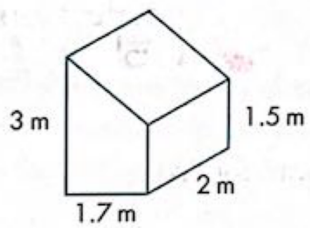
4 A lean-to is a prism. Calculate the volume of air inside the lean-to with the dimensions shown in the diagram. Give your answer in litres.



$$\text{Volume} = \tfrac{1}{2}(1.5 + 3) \times 1.7 \times 2$$
$$= 7.65 \text{ m}^3$$
$$= 7.65 \times 1000 \text{ litres}$$
$$= 7{,}650 \text{ litres}$$

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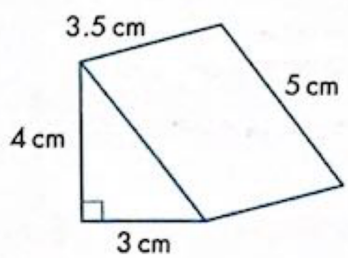
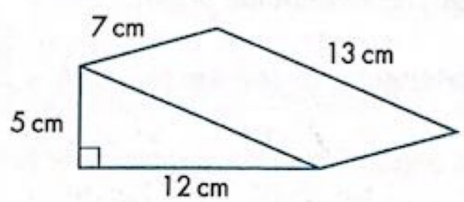
5 Each of these prisms has a regular cross-section in the shape of a right-angled triangle.

a Find the volume of each prism. **b** Find the total surface area of each prism.





a) Area of cross-section

$= \frac{1}{2} \times 3 \times 4$

$= 6 \text{ cm}^2$

Volume $= 6 \times 3.5$

$= 21 \text{ cm}^3$

Area of cross-section

$= \frac{1}{2} \times 12 \times 5$

$= 30 \text{ cm}^2$

Volume $= 30 \times 7$

$= 210 \text{ cm}^3$

Surface area

= 2 triangles + 3 rectangles

$2\left(\frac{3 \times 4}{2}\right) + 3.5 \times 3$

$+ 3.5 \times 4$

$+ 3.5 \times 5$

$= 54 \text{ cm}^2$

Surface area

= 2 triangles + 3 rectangles

$2\left(\frac{5 \times 12}{2}\right) + 7 \times 5$

$+ 7 \times 12$

$+ 7 \times 13$

$= 270 \text{ cm}^2$