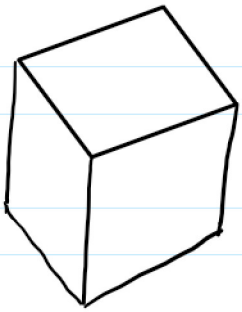
Nets

23 November 2019 15:20

A net is a two dimensional representation (drawing) of a 3D shape

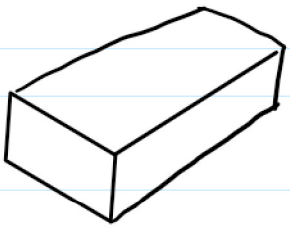
A prism is a solid object which has the same crosss section all along its length

Eg.s of prisms



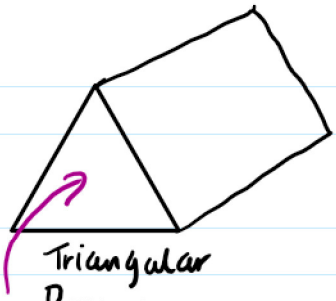
Cube

"all the sides are the same"



cuboid

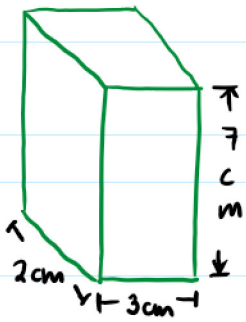
"rectangular prism"



Cross section.

"face"

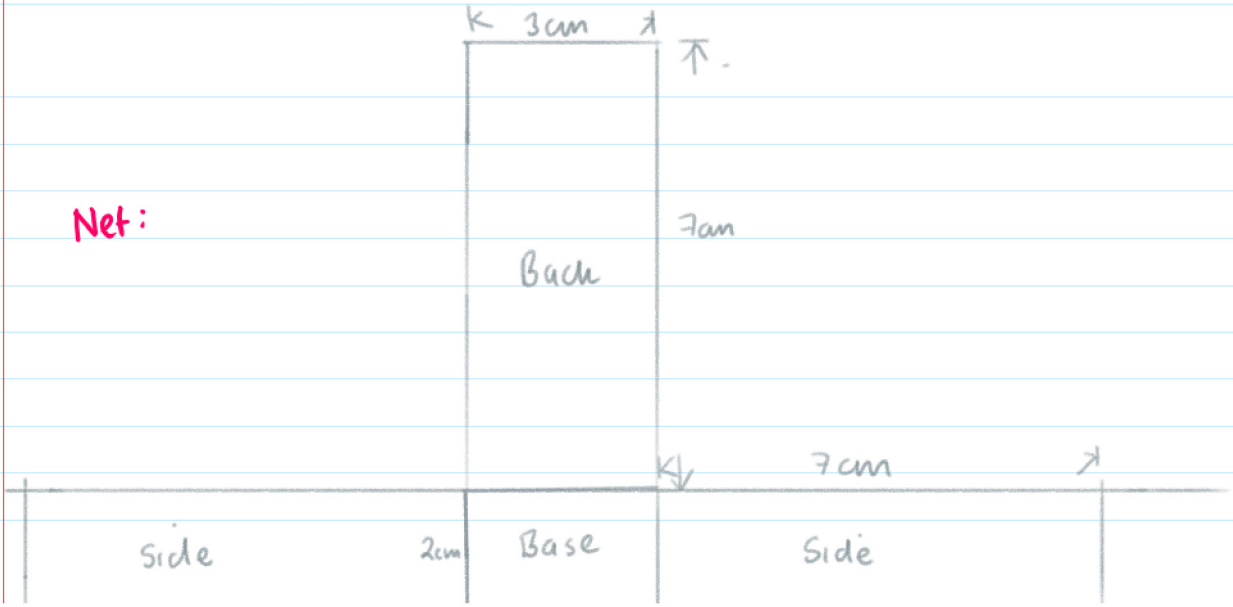
Q1 Draw an accurate net for the rectangular prism



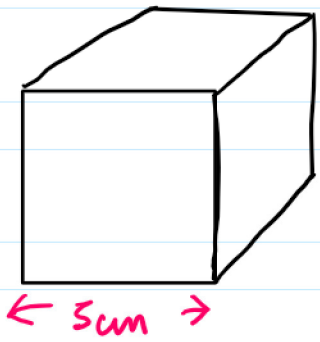
Method: Use a ruler

1) Draw the base
2) Draw the sides
3) the front and back
4) Don't forget the top
5) Use a pencil.

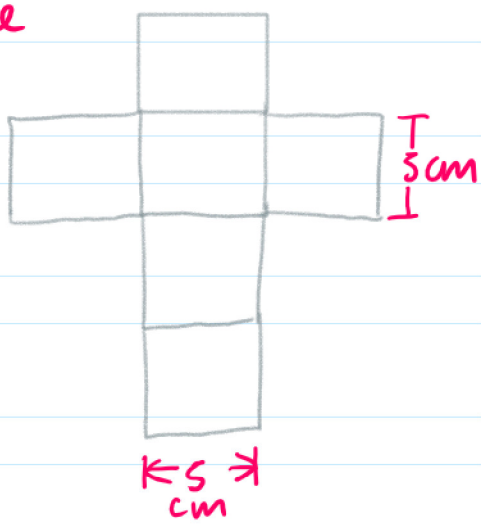
Net:



Draw the net of a cube with sides of 5cm



1 example



Class work

New Pg 127 Q15

Draw the net of a cylinder

T&T2 6.4
Rectangul...

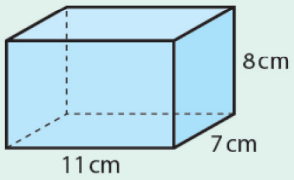
Perimeter – Area – Volume

chapter 6

Section 6.4 Rectangular solids

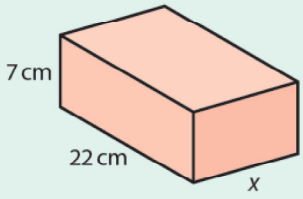
Example 1

Find (i) the volume (ii) the surface area of the given rectangular solid.



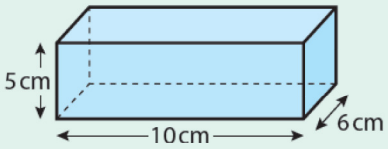
Example 2

The volume of the rectangular box shown is 2156 cm^3.
Find the length of the side marked x.



Example 3

By drawing a net of this closed rectangular box, find its total surface area.

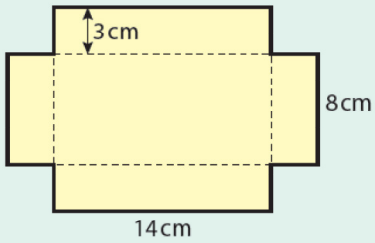


Example 4

This is the net of an open box.
If this net is folded along the dotted lines to make a box, find

(i) the volume of the box

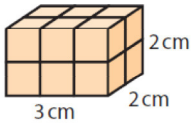
(ii) the surface area of the outside of the box.



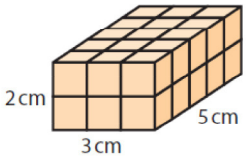
Exercise 6.4

1. Find the volume of each of these rectangular solids:

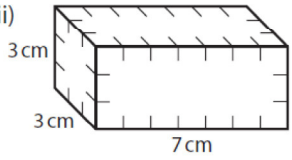
(i)



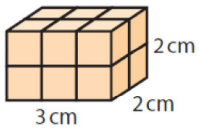
(ii)



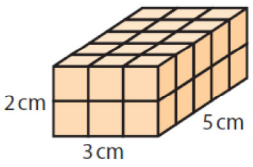
(iii)



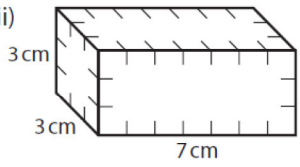
(i)



(ii)



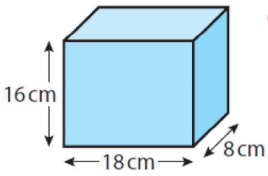
(iii)



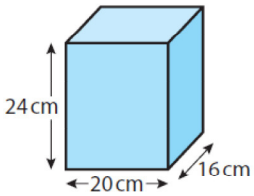
2. Find the surface area of each of the solids in Question 1 above.

3. Find (a) the volume (b) the surface area of these solid cuboids:

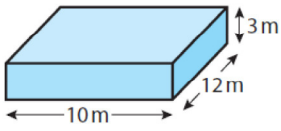
(i)



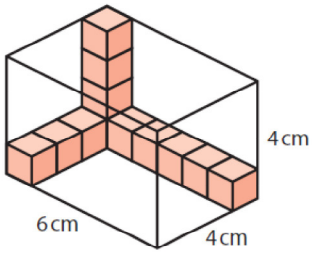
(ii)



(iii)

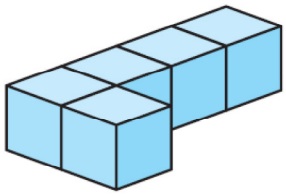


4. The diagram shows a rectangular box partly filled with cubes of side 1 cm.
How many more of these cubes are required to fill the box?



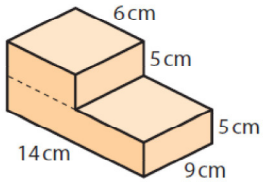
5. Five cubes of side 2 cm are joined to make the solid shown.
Which of the following is the surface area of the solid?

(i) 68 cm^2 (ii) 72 cm^2 (iii) 20 cm^2 (iv) 88 cm^2

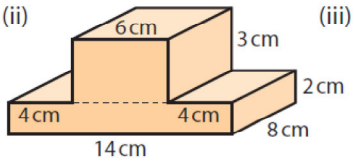


6. Each of the solid shapes below can be broken into two or more rectangular solids. The dotted lines indicate how the figures may be divided.
Now find the total volume of each of these shapes:

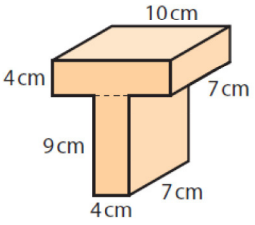
(i)



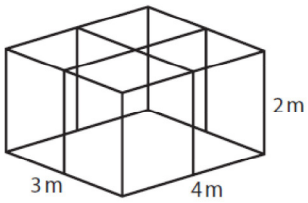
(ii)



(iii)



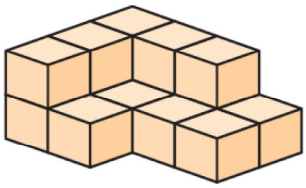
7. The framing of a toolshed consists of square, galvanised tubing which costs €12.80 a metre. Find the total cost of the tubing necessary to make the framing of the shed illustrated.



8. The figure on the right shows a stack of cubes of side 3 cm.

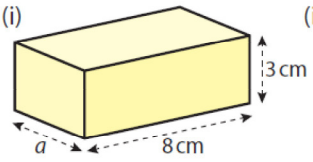
Find (i) the volume of the stack in cm^3

(ii) the surface area of the stack in cm^2.



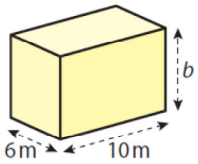
9. The volume of each of the following rectangular solids is given.
Find the length of the side marked with a letter.

(i)



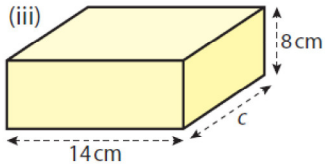
Volume = 120 cm^3

(ii)



Volume = 420 m^3

(iii)

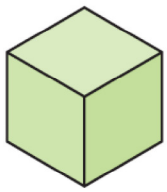


Volume = 2240 cm^3

10. The surface area of this cube is 150 cm^2.

Find (i) the length of the side of the cube

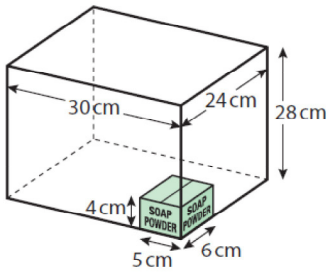
(ii) the volume of the cube.



11. Hannah is packing packets of soap powder into a box, as shown.

(i) How many will fit along the 30 cm side?

(ii) How many packets of soap powder will fit in the box altogether?



12. The volume of a cube is 64 cm^3.

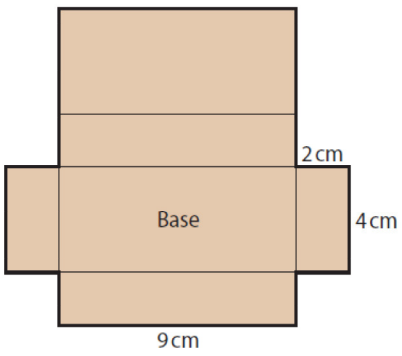
Find (i) the length of the side of the cube

(ii) the surface area of the cube.

13. This is the net of a rectangular box.

Find (i) the surface area of the box

(ii) the volume of the box.

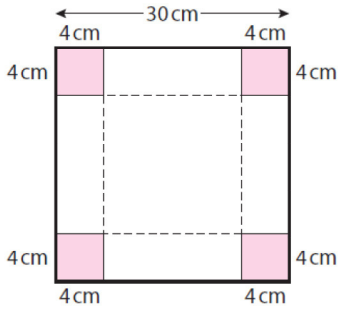


14. A square sheet of metal has a side of length 30 cm. Four identical squares of side 4 cm are cut away from the corners, as shown. The remaining shape is folded to form a box.

(i) Is the box an open or closed box?

(ii) Find the volume of the box.

(iii) Find the outer surface area of the box.

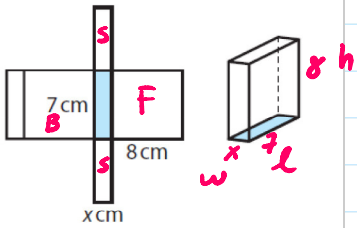


15. The net on the right folds to make a rectangular box. The rectangle that is shaded blue is the base.

(i) What is the height of the box? 8cm

(ii) The volume of the box is 84 cm^3. Find the value of x.

(iii) Find the surface area of the box.



ii) $l \times w \times h = 84$

$7 \times (x) \times 8 = 84$

$56x = 84$

$\div 56 \quad 1x = 1.5 \quad \div 56$

$l = 7$

$w = 1.5$

$h = 8$

Base + Top

$2(7 \times 1.5) = 21\text{ cm}^2$

Sides

$2(1.5 \times 8) = 24$

Front + Back

$2(8 \times 7) = 112$

Total $= 21 + 24 + 112$

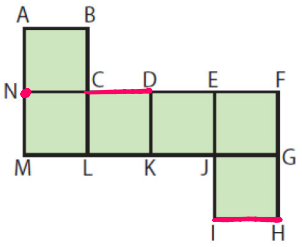
$= 157\text{ cm}^2$

16. This net is folded to make a cube.

(i) Which vertex (corner) will join to N? → F

(ii) Which line will join to [CD]? CB

(iii) Which line will join to [IH]?



H/W

New Pg 128 Q18

OLD 105 Q 18

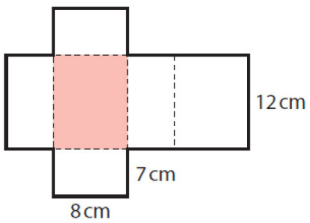
17. The net shown is folded to make a rectangular box.
The pink rectangle will be the base of the box.

(i) Write down the height of the box.

(ii) Is the box open or closed?

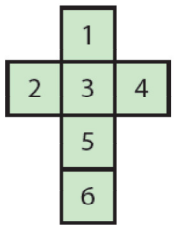
(iii) Find the volume of the box.

(iv) Work out the surface area of the box.

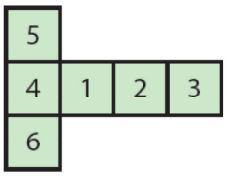


18. Here are the nets of a cube.

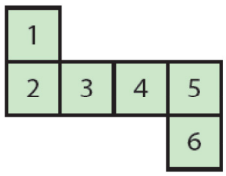
A



B

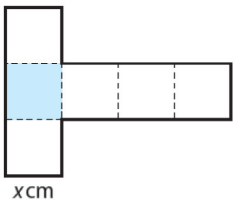


C



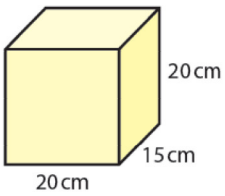
Imagine that each of these nets is folded to make a cube.
For each net, which face would be opposite face 1 when folded?

19. This is the net of a cube of side x cm.
The volume of the cube is numerically equal to the surface area of the cube.
Write an equation in x and solve it to find the length of the side of the cube.

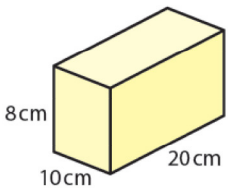


20. If 1 litre = 1000 cm^3, find the capacity of these rectangular containers in litres.

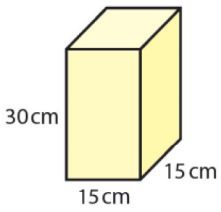
(i)



(ii)



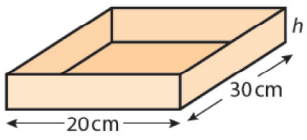
(iii)



21. The rectangular container on the right has a capcity of 4.8 litres.

(i) Write down the volume of the container in cm^3.

(ii) Find the height h of the container in centimetres.



Answers

Exercise 6.4

1. (i) 12 cm^3 (ii) 30 cm^3 (iii) 63 cm^3

2. (i) 32 cm^2 (ii) 62 cm^2 (iii) 102 cm^2

3. (i) (a) 2304 cm^3 (b) 1120 cm^2

(ii) (a) 7680 cm^3 (b) 2368 cm^2

(iii) (a) 360 m^3 (b) 372 m^2

4. 84

5. (iv) 88 cm^2

6. (i) 900 cm^3 (ii) 368 cm^3 (iii) 532 cm^3

7. €652.80

8. (i) 405 cm^3 (ii) 414 cm^2

9. $a = 5$ cm, $b = 7$ m, $c = 20$ cm

10. (i) 5 cm (ii) 125 cm^3

Answers

11. (i) 6 (ii) 168

12. (i) 4 cm (ii) 96 cm^2

13. (i) 124 cm^2 (ii) 72 cm^3

14. (i) open (ii) 1936 cm^3 (iii) 836 cm^2

15. (i) 8 cm (ii) 1.5 (iii) 157 cm^2

16. (i) F (ii) [CB] (iii) [KL]

17. (i) 7 cm (ii) closed

(iii) 672 cm^3 (iv) 472 cm^2

18. A – 5, B – 3, C – 6

19. $x^3 = 6x^2$; 6 cm

20. (i) 6 ℓ (ii) 1.6 ℓ (iii) 6.75 ℓ

21. (i) 4800 cm^3 (ii) 8 cm