

Bell Work - IB Math Studies 2

A harpsichord case has the dimensions shown.

- a Find the area of the top and bottom surfaces.
- b Find the area of each side of the case.
- c If the timber costs \$128 per square metre, find the cost of the timber to construct this case.

$$A = 81(75) + (219-75)(81) = 11907(2) = 23814 \text{ cm}^2$$

$$b \quad 219 - 75 = 144$$

$$144^2 + 81^2 = 27297$$

$$\sqrt{27297} = 165.23$$

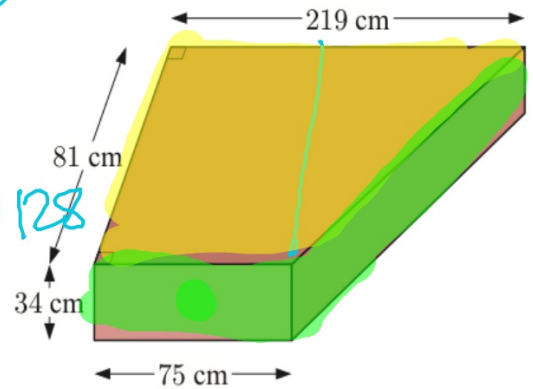
$$= 23814 \text{ cm}^2$$

$$(34 \times 75) + (165.23 \times 34) + (34 \times 75) + (34 \times 219)$$

$$= 18367.82 \text{ cm}^2$$

$$18367.82 + 23814 = 42181.82$$

$$\frac{42181.82 \times 128}{10000} = \$539.93$$

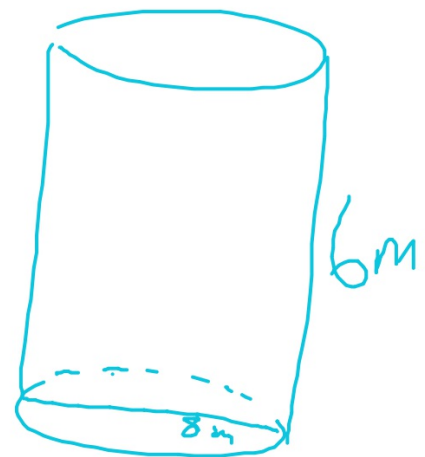
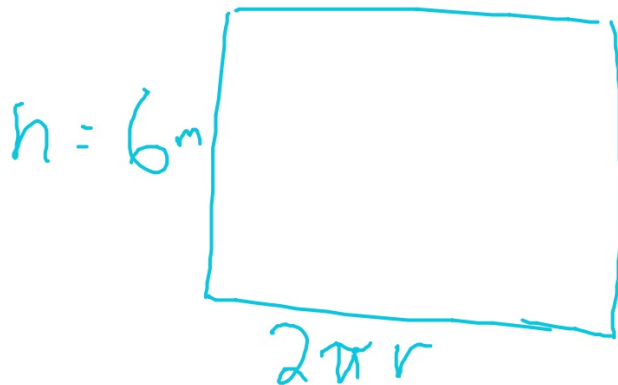


Questions on the assignment?

Exercises:

14C.1 #1a-c

14C.2 #2c,d, 5c, 7, 10



Chapter

14

Perimeter, area, and volume

- A** Conversion of units
- B** Perimeter
- C** Area
- D** Surface area
- E** Volume
- F** Capacity
- G** Density (Extension)
- H** Harder applications

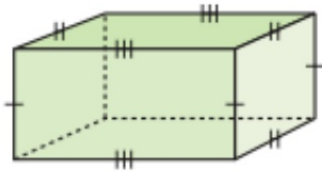
Syllabus reference: 1.4, 5.5

D

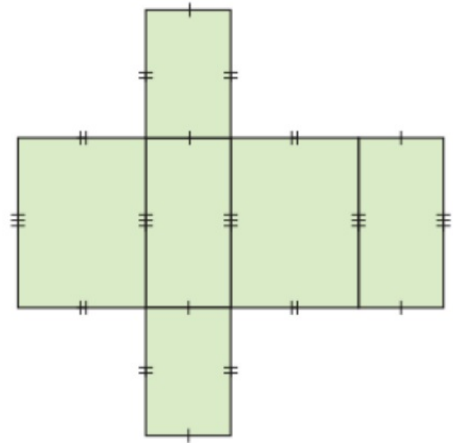
SURFACE AREA

The **surface area** of a three-dimensional figure with plane faces is the sum of the areas of the faces.

the surface area of

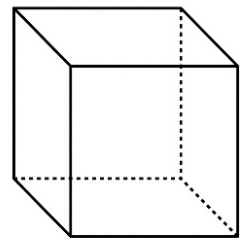


= the area of



Draw each of the following and hence find its surface area:

an ice cube with sides 2.5 cm



Draw each of the following and hence find its surface area:

a block of cheese measuring 14 cm by 8 cm by 3 cm

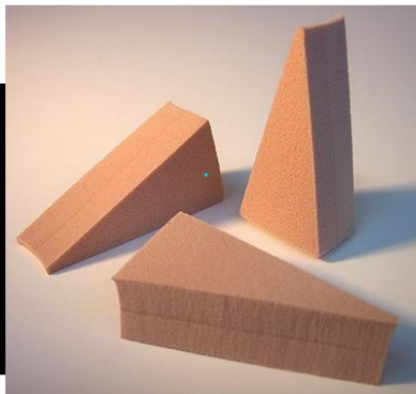
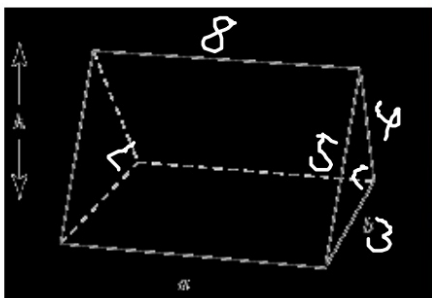


Draw each of the following and hence find its surface area:

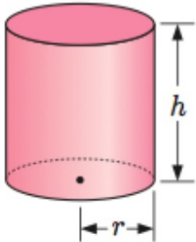
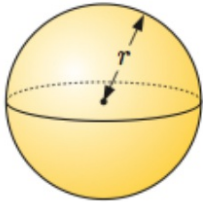
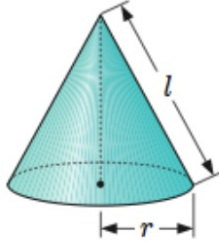
a wooden wedge with a 3 cm by 4 cm by 5 cm right-triangular cross-section and length 8 cm.

$$\square (8 \times 5) + (8 \times 4) + (8 \times 3)$$

$$\triangle 2 \left(\frac{1}{2} \times 3 \times 4 \right)$$



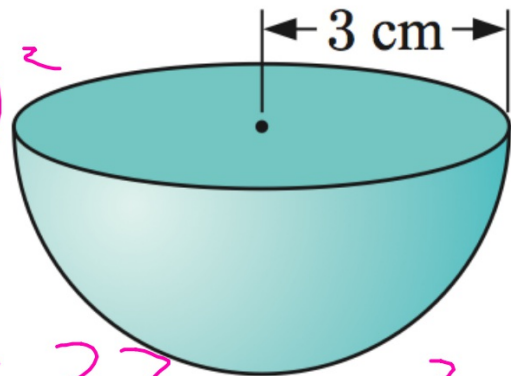
CYLINDERS, SPHERES, AND CONES

		
<p>Cylinder</p> <p>$A = \text{curved surface}$ $+ 2 \text{ circular ends}$ $= 2\pi r h + 2\pi r^2$</p>	<p>Sphere</p> <p>$A = 4\pi r^2$</p>	<p>Cone</p> <p>$A = \text{curved surface}$ $+ \text{circular base}$ $= \pi r l + \pi r^2$</p>

Find the total surface area of the solid hemisphere shown.

$$\frac{4\pi(3)^2}{2} + \pi(3)^2$$

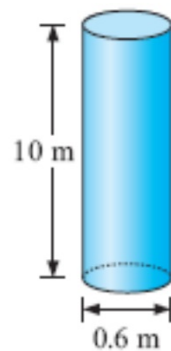
$$18\pi + 9\pi = 27\pi \text{ cm}^2$$



A new wharf has 24 cylindrical concrete pylons, each with diameter 0.6 m and length 10 m. The pylons will be coated with a salt resistant material.

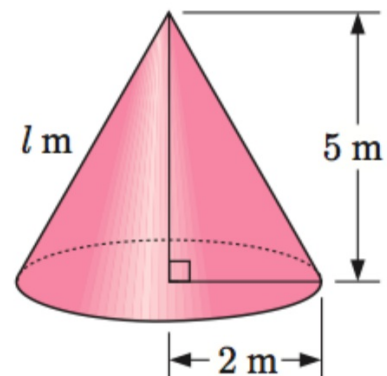
- a Find the total surface area of one pylon.
- b Coating the pylons with the material costs £45.50 per m^2 . Find the cost of coating one pylon.
- c Find the total cost of coating the 24 pylons.

$$\begin{aligned} \text{a) } & 2\pi rh \\ & 2\pi (.3)(10) = 18.8 \text{ m}^2 \end{aligned}$$



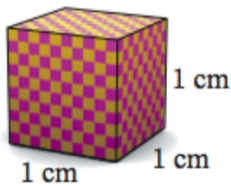
A conical tent has base radius 2 m and height 5 m.

- a Find the slant height l , to 2 decimal places.
- b Find the area of canvas necessary to make the tent, including the base.
- c If canvas costs \$18 per m^2 , find the cost of the canvas.



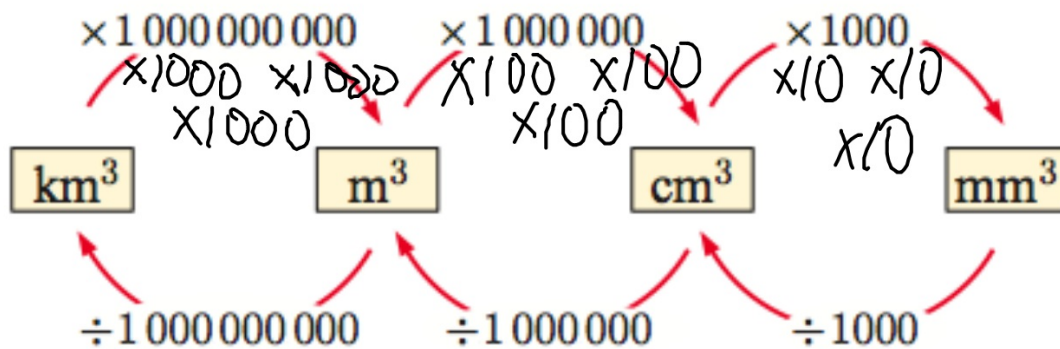
UNITS OF VOLUME

The most common units of volume are the cubes of the units of length.



$$1 \text{ cm}^3 \\ = 10 \text{ mm} \times 10 \text{ mm} \times 10 \text{ mm} \\ = 1000 \text{ mm}^3$$

$$1 \text{ m}^3 \\ = 100 \text{ cm} \times 100 \text{ cm} \times 100 \text{ cm} \\ = 1\,000\,000 \text{ cm}^3$$



2 Convert:

a $39\,100\,000\text{ cm}^3$ to m^3

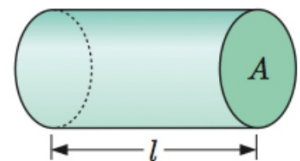
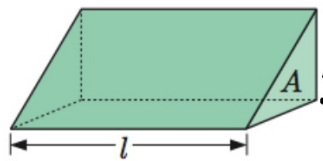
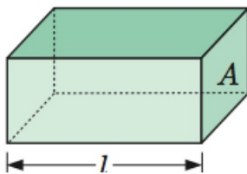
b 0.51 cm^3 to mm^3

c $469\,000\text{ cm}^3$ to m^3

UNIFORM SOLIDS

If the perpendicular cross-section of a solid is always the same shape and size all the way along the object, we call it a **solid of uniform cross-section**.

In each of the following examples, A is the cross-sectional area and l is the length of the solid.



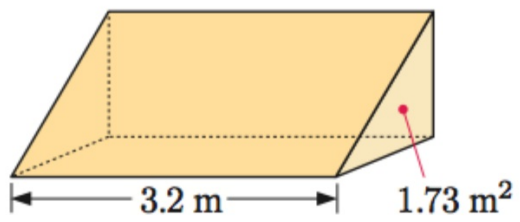
For all solids of uniform cross-section,

$$\text{volume} = \text{length} \times \text{area of cross-section}$$

or $V = l \times A$

Calculate the volume of:

a



Calculate the volume of:

b

