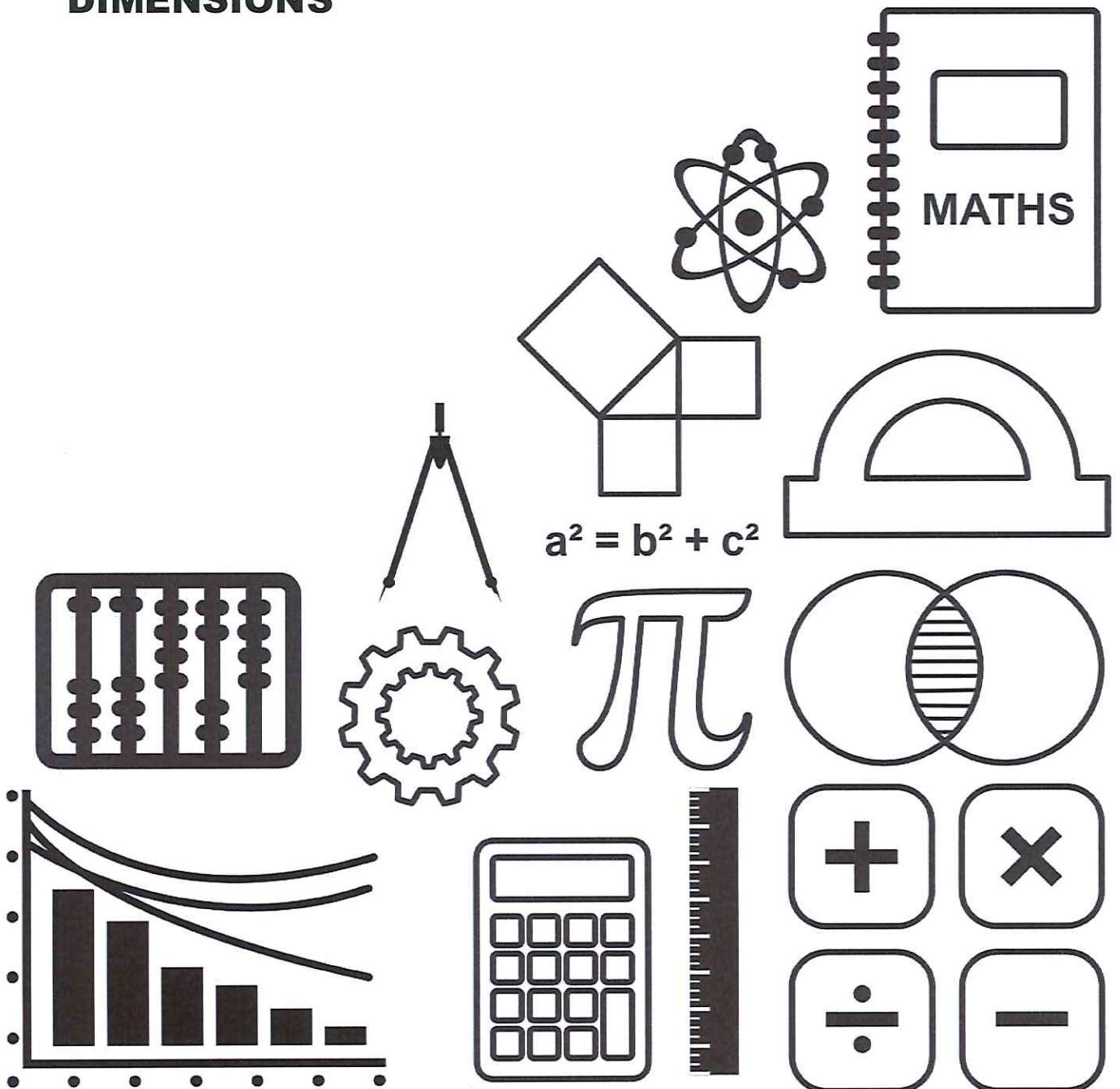


SOLUTIONS

GCSE TOPIC BOOKLET DIMENSIONS



1. Each of the following quantities has a particular number of dimensions. Give the number of dimensions of each quantity. The first one has been done for you.

Quantity	Number of dimensions
The volume of a cone	3
The perimeter of a polygon	1
The capacity of a bucket	3
How far a satellite travels in one orbit of the Earth	1
The area of the cross-section of a prism	2

[2]

2. In each of the following formulae, every letter stands for the measurement of a length. By considering the dimensions implied by each formula, write down, for each case, whether the formula could be for a length, an area, a volume or none of these.

The first one has been done for you.

Formula could be for

$4d^2 + 2dh$	area
$10r^3 + 5hr^2$	volume
$4h + 2d - 8h$	length
$(r^2 - 7hd)h$	volume
$r^2 + 8dh + 3hr$	area

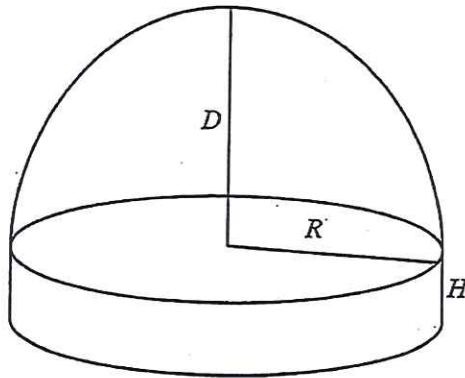
[2]

3. Each of the following quantities has a particular number of dimensions. Give the number of dimensions of each quantity. The first one has been done for you.

Quantity	Number of dimensions
The area of a circle	2
The distance a javelin is thrown by an athlete	1
The capacity of a jug	3
The perimeter of a circle	1
The cross-sectional area of a prism	2

[2]

The diagram shows a solid. The lengths D , R and H are as shown.



One of the following formulae may be used to estimate V , the volume of the solid.

$$V = 3H + 2R + 5D$$

$$V = 3R + 5DR$$

$$V = 3R^2H + 2R^2D$$

$$V = 3R(4D + 5H)$$

- (a) Explain why the formula $V = 3H + 2R + 5D$ cannot be used to estimate the volume of the solid.

It would be a length.

[1]

- (b) State, with a reason, which of the above formulae may be used to estimate the volume of the solid.

$$V = 3R^2H + 2R^2D$$

$3R^2H$ is a volume, $2R^2D$ is a volume

volume + volume = volume

[2]

5.

In the following formulae, each measurement of length is represented by a letter.

Consider the dimensions implied by the formulae.

Write down, for each case, whether the formula could be for a length, an area, a volume or none of these.

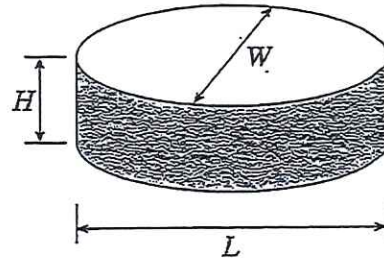
The first one has been done for you.

[3]

<u>Formula</u>	<u>Formula could be for</u>
$d^3 - 3 \cdot 14r^2h$ volume
$d^2 + hw$ area
$d + w + h$ length
$2\pi r - \pi r^2$ none of these
$(d + h)w$ area
$d^3 + dwh$ volume

6.

Some pills are in the form of elliptical prisms, L mm long, W mm wide and H mm thick.



(a) Explain why the formula $V = 0.8(L + W + H)$ cannot be used to estimate the volume of a pill.

It would be a length

[1]

(b) One of the following formulae may be used to estimate the volume of a pill.

$V = 0.8LWH$

$V = 0.8LW + H$

$V = 0.8(L + W)H$

$V = 0.8L + WH$

Ring the correct formula.

[1]

7. In each of the following formulae, every letter stands for the measurement of a length. By considering the dimensions implied by the formulae, write down, for each case, whether the formulae could be for a length, an area, a volume or none of these.

The first one has been done for you.

$$3d^3 - dhr$$

Formulae could be for:

volume

length

$$5d - 7h + 3r$$

none of these

$$7rdh - 6dr + d^2$$

area

$$(d + 2h)r$$

volume

$$6r^2h + 5h^2r$$

[2]

8. In each of the following formulae, every letter stands for the measurement of a length. By considering the dimensions implied by the formulae, write down, for each case, whether the formulae could be for a length, an area, a volume or none of these.

The first one has been done for you.

$$6r^2h + 4r^3$$

Formula could be for:

volume

area

$$6r^2 + 4dh$$

area

$$6(r + 4d)h$$

none of these

$$6r^2 + 4dh + 3h$$

length

$$6r + 4d + 3h$$

[2]