Edexcel GCSE
Mathematics (Linear) – 1MA0

VOLUME OF PRISM

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers
Nil

Instructions
Use black ink or ball-point pen.
Fill in the boxes at the top of this page with your name, centre number and candidate number.
Answer all questions.
Answer the questions in the spaces provided – there may be more space than you need.
Calculators may be used.

Information
The marks for each question are shown in brackets – use this as a guide as to how much time to spend on each question.
Questions labelled with an asterisk (*) are ones where the quality of your written communication will be assessed – you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.

Advice
Read each question carefully before you start to answer it.
Keep an eye on the time.
Try to answer every question.
Check your answers if you have time at the end.
1. Here is a cuboid.

![Diagram of a cuboid with dimensions 20 cm x 20 cm x 40 cm]

Work out the volume of the cuboid.

\[20 \times 20 \times 40\]

\[16000 \text{ cm}^3\]

(3 marks)

2. The diagram shows two fish tanks, each in the shape of a cuboid.

![Diagram of two cuboids, A and B, with different dimensions]

Finley fills both fish tanks with water.

Which fish tank holds the most water?
You must show all your calculations.

Volume of A = \(35 \times 95 \times 30 = 99750 \text{ cm}^3\)

Volume of B = \(65 \times 45 \times 35 = 102375 \text{ cm}^3\)

Tank B will hold more water as the shape has a greater volume.

(4 marks)
3. The diagram shows a prism.

![Diagram of a prism with dimensions labeled.]

Diagram NOT accurately drawn

Work out the volume of the prism.

\[
\text{Volume} = \text{area of cross section} \times \text{length}
\]

\[
= 38 \times 10
\]

\[
= 380 \text{ cm}^3
\]

\[
\text{380} \quad \text{cm}^3
\]

(4 marks)
4. Here is a solid prism.

Work out the volume of the prism.

\[ \text{Volume} = \text{area of cross-section} \times \text{length} \]
\[ = 59 \times 20 \]
\[ = 1180 \text{ cm}^3 \]
5.

Work out the volume of the triangular prism.

\[
\text{Volume} = \text{area of cross section} \times \text{length}
\]

\[
= \frac{8 \times 15}{2} \times 10
\]

\[
= 60 \times 10
\]

\[
= 600 \text{ cm}^3
\]

\[600 \text{ cm}^3\]

(4 marks)

6.

Calculate the volume of the triangular prism.

\[
\frac{4 \times 3}{2} \times 7
\]

\[
6 \times 7
\]

\[42 \text{ cm}^3\]

(4 marks)
7. The diagram shows a triangular prism.

Diagram NOT accurately drawn

$BC = 4 \text{ cm}, CF = 12 \text{ cm}$ and angle $ABC = 90^\circ$.
The volume of the triangular prism is $84 \text{ cm}^3$.
Work out the length of the side $AB$ of the prism.

\[
\frac{x \times 4}{2} \times 12 = 84
\]

\[
\frac{4x}{2} \times 12 = 84
\]

\[
2x \times 12 = 84
\]

\[
24x = 84
\]

\[
x = \frac{84}{24}
\]

\[
= \frac{4}{1.2}
\]

\[
= \frac{21}{6}
\]

\[
= \frac{7}{2}
\]

$\frac{7}{2} \text{ cm}$

$3.5 \text{ cm}$

(4 marks)
8. The diagram shows a triangular prism.

The cross-section of the prism is a trapezium. The lengths of the parallel sides of the trapezium are 8 cm and 6 cm. The distance between the parallel sides of the trapezium is 5 cm. The length of the prism is 20 cm.

Work out the volume of the prism.

\[
\text{Volume} = \text{area of cross section} \times \text{length}
\]

\[
= \frac{8 + 6}{2} \times 5 \times 20
\]

\[
= 70 \times 20
\]

\[
= 700 \text{ cm}^3
\]

\[
\boxed{700 \text{ cm}^3}
\]

(4 marks)
A skip is in the shape of a prism with cross-section $ABCD$. $AD = 2.3\, \text{m}$, $DC = 1.3\, \text{m}$ and $BC = 1.7\, \text{m}$.
The width of the skip is $1.5\, \text{m}$.

(a) Calculate the area of the shape $ABCD$.

$$\frac{1.7 + 2.3}{2} \times 1.3$$

$$2.6\, \text{m}^2$$

(2 marks)

(b) Calculate the volume of the skip.

$$2.6 \times 1.5 = 3.9\, \text{m}^3$$

(3 marks)