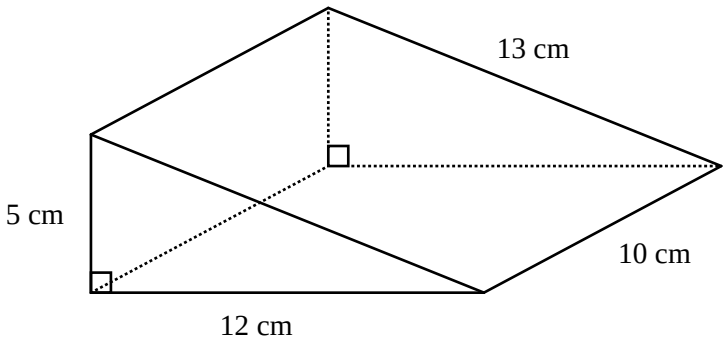
Volume and Surface Area of Prisms

SCAN ME

REVISE THIS TOPIC

1 The diagram shows a prism.



(a) Work out the volume of the prism.

$\frac{1}{2} \times 12 \times 5 = 30\text{ cm}^2$

$30 \times 10 = 300\text{ cm}^3$

300 ..... cm^3

(3)

(b) Work out the surface area of the prism.

$\frac{1}{2} \times 12 \times 5 = 30\text{ cm}^2$

$\frac{1}{2} \times 12 \times 5 = 30\text{ cm}^2$

$10 \times 12 = 120\text{ cm}^2$

$10 \times 5 = 50\text{ cm}^2$

$10 \times 13 = 130\text{ cm}^2$

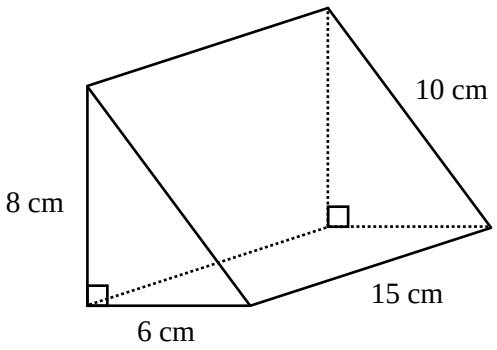
$30 + 30 + 120 + 50 + 130 = 360$

360 ..... cm^2

(4)

(Total for Question 1 is 7 marks)

2 The diagram shows a prism.



(a) Work out the volume of the prism.

$\frac{1}{2} \times 6 \times 8 = 24 cm^2$

$24 \times 15 = 360 cm^3$

360 ..... cm^3

(3)

(b) Work out the surface area of the prism.

$\frac{1}{2} \times 6 \times 8 = 24 cm^2$

$\frac{1}{2} \times 6 \times 8 = 24 cm^2$

$6 \times 15 = 90 cm^2$

$8 \times 15 = 120 cm^2$

$10 \times 15 = 150 cm^2$

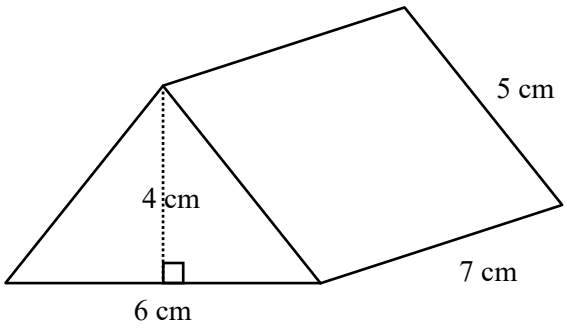
$24 + 24 + 90 + 120 + 150 = 408$

408 ..... cm^2

(4)

(Total for Question 2 is 7 marks)

3 The diagram shows a prism.



(a) Work out the volume of the prism.

$\frac{1}{2} \times 6 \times 4 = 12 cm^2$

$12 \times 7 = 84 cm^3$

84 ..... cm^3

(3)

(b) Work out the surface area of the prism.

$\frac{1}{2} \times 6 \times 4 = 12 cm^2$

$\frac{1}{2} \times 6 \times 4 = 12 cm^2$

$6 \times 7 = 42 cm^2$

$7 \times 5 = 35 cm^2$

$7 \times 5 = 35 cm^2$

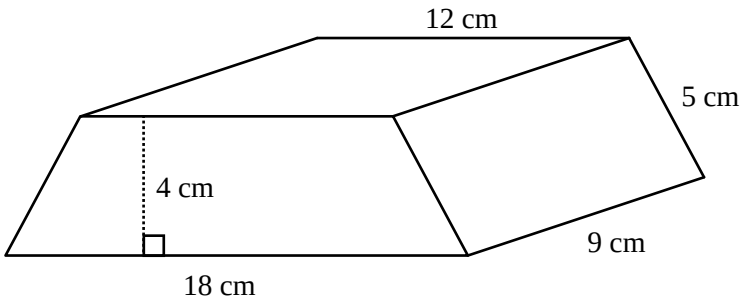
$12 + 12 + 42 + 35 + 35 = 136$

136 ..... cm^2

(4)

(Total for Question 3 is 7 marks)

4 The diagram shows a prism.



(a) Work out the volume of the prism.

$\frac{1}{2}(12+18) \times 4 = 60\text{cm}^2$

$60 \times 9 = 540\text{ cm}^3$

540 ..... cm^3

(3)

(b) Work out the surface area of the prism.

$\frac{1}{2}(12+18) \times 4 = 60\text{cm}^2$

$\frac{1}{2}(12+18) \times 4 = 60\text{cm}^2$

$9 \times 5 = 45\text{ cm}^2$

$9 \times 5 = 45\text{ cm}^2$

$9 \times 18 = 162\text{ cm}^2$

$9 \times 12 = 108\text{ cm}^2$

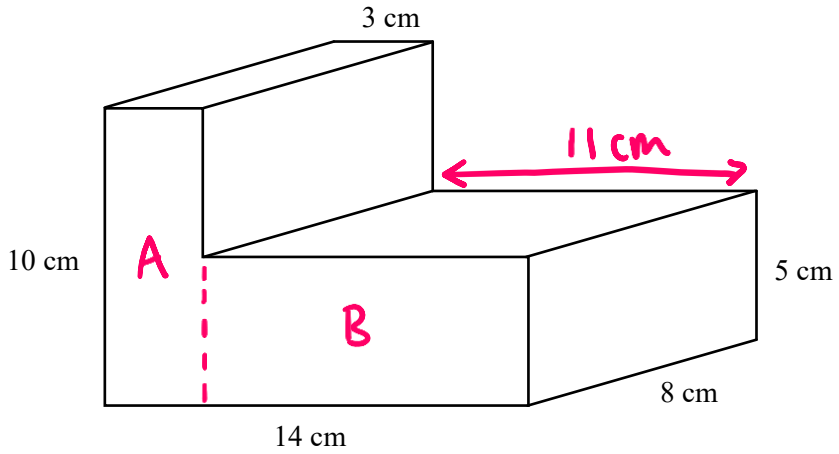
$60+60+45+45+162+108 = 480$

480 ..... cm^2

(4)

(Total for Question 4 is 7 marks)

5 The diagram shows a prism.



Work out the volume of the prism.

A : $3 \times 10 = 30 cm^2$

B : $11 \times 5 = 55 cm^2$

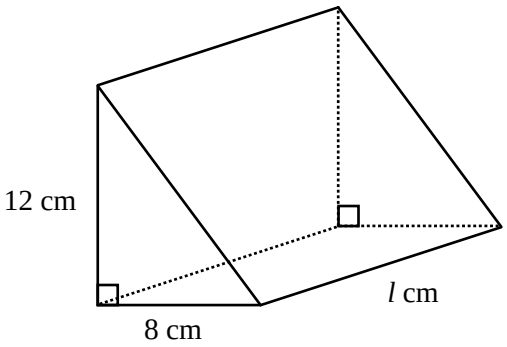
$30 + 55 = 85 cm^2$

$85 \times 8 = 680 cm^3$

680 ..... cm^3

(Total for Question 5 is 4 marks)

6 The diagram shows a prism.



The volume of the prism = 696 cm^3

Work out the value of l, the length of the prism.

$\frac{1}{2} \times 8 \times 12 = 48\ cm^2$

$696 \div 48 = 14.5$

l = 14.5 cm

(Total for Question 6 is 3 marks)

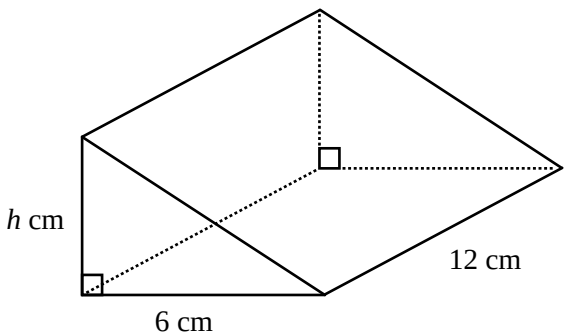
7 Prism **A**, Prism **B** and Prism **C** all have the same volume.

Complete the table.

	Prism A	**Prism B**	**Prism C**
Cross Sectional Area	24 cm^2	20cm^2	40 cm^2
Length	15 cm	18 cm	9cm
Volume	360cm^3	360cm^3	360cm^3

(Total for Question 7 is 4 marks)

8 The diagram shows a prism with a cross section that is a right-angled triangle.



The prism has a volume of 162 cm^3
Work out the value of *h*, the height of the right-angled triangle.

$162 \div 12 = 13.5$

$\frac{1}{2} \times 6 \times h = 13.5$

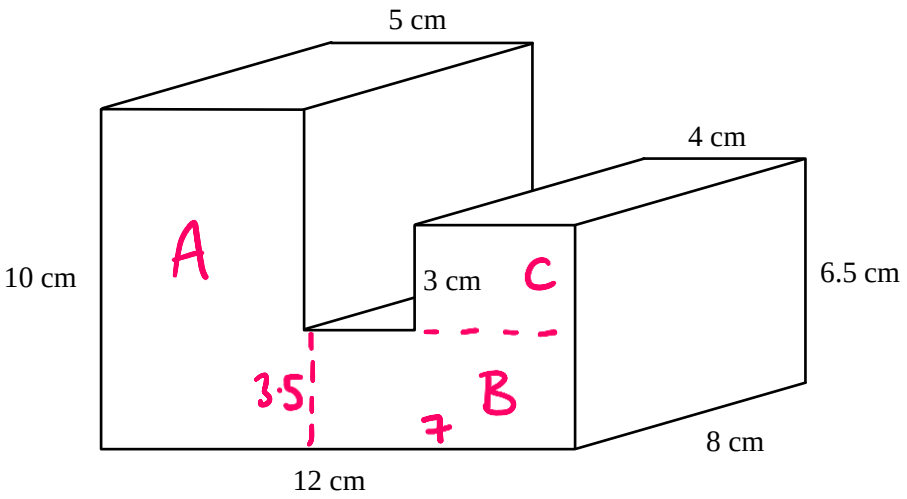
$\div 3 \left(3h = 13.5 \right) \div 3$

$h = 4.5$

l = 4.5 cm

(Total for Question 8 is 3 marks)

9 The diagram shows a prism.



Work out the volume of the prism.

A: $10 \times 5 = 50 cm^2$

B: $7 \times 3.5 = 24.5 cm^2$

C: $4 \times 3 = 12 cm^2$

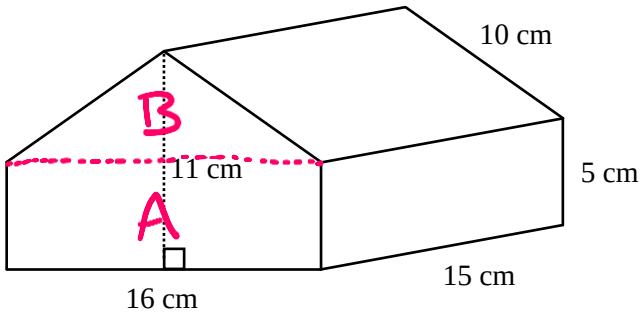
$50 + 24.5 + 12 = 86.5$

$86.5 \times 8 = 692$

692 ..... cm^3

(Total for Question 9 is 5 marks)

10 The diagram shows a prism.



The cross section is a pentagon with one line of symmetry.

(a) Work out the volume of the prism.

A: $16 \times 5 = 80 cm^2$
B: $\frac{1}{2} \times 16 \times 6 = 48 cm^2$
$80 + 48 = 128 cm^2$

$128 \times 15 = 1920$

1920 ..... cm^3

(4)

(b) Work out the surface area of the prism.

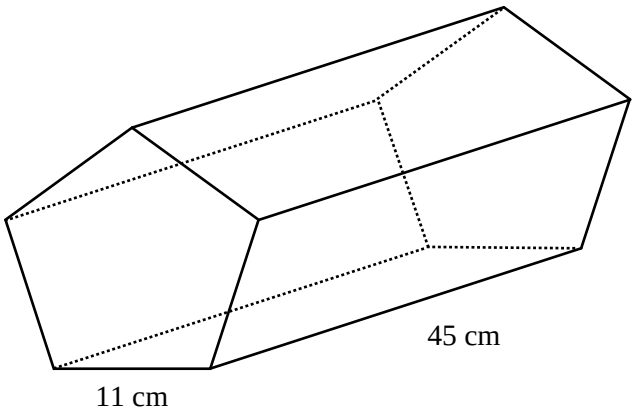
$15 \times 5 = 75$
$15 \times 5 = 75$
$15 \times 10 = 150$
$15 \times 10 = 150$
$16 \times 15 = 240$
$75 + 75 + 150 + 150 + 240 + 128 + 128$

946 ..... cm^2

(4)

(Total for Question 10 is 8 marks)

11 The diagram shows a prism.



The cross section is a regular pentagon.
The volume of the prism = 9368 cm^3

Work out the total surface area of the prism.
Give your answer to 4 significant figures.

$9368 \div 45 = 208.17...$

$45 \times 11 = 495$
$495 \times 5 = 2475$

$2475 + 208.17... + 208.17...$
$= 2891.35...$

2891 ..... cm^2

(Total for Question 11 is 4 marks)