

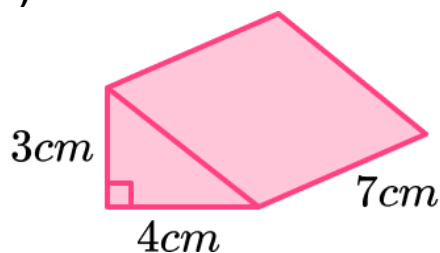
# Volume and Surface Area of Triangular Prisms - Worksheet

## Skill

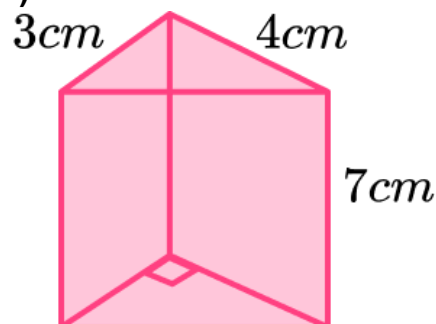
### Group A - Volume

Work out the volume of each triangular prism

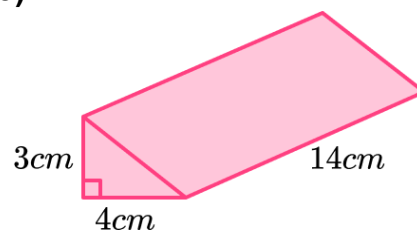
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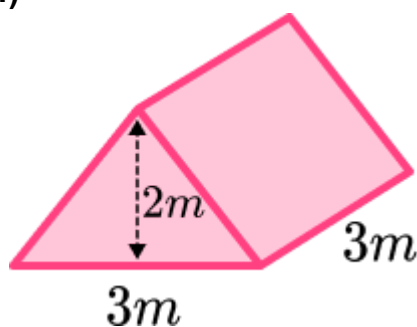
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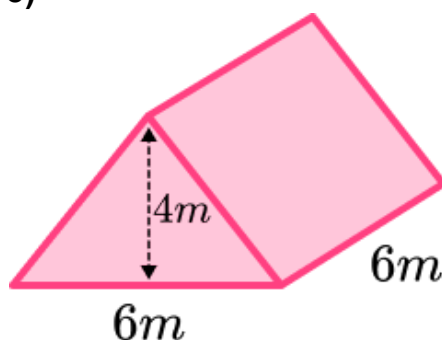
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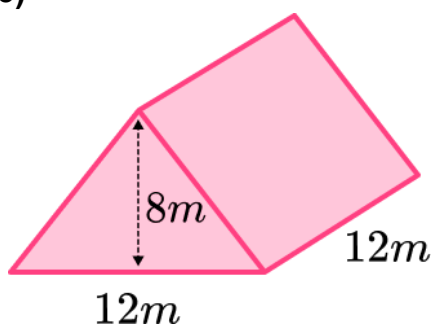
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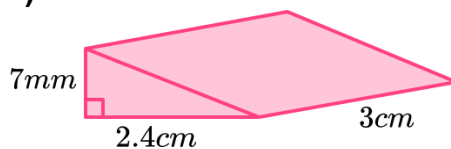
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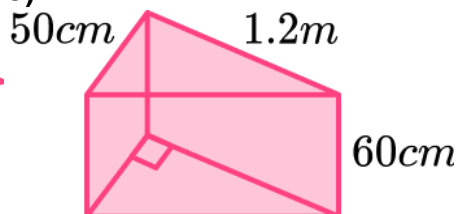
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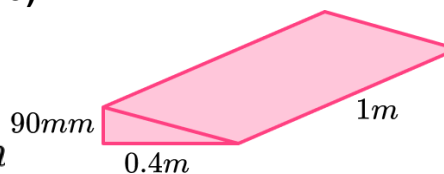
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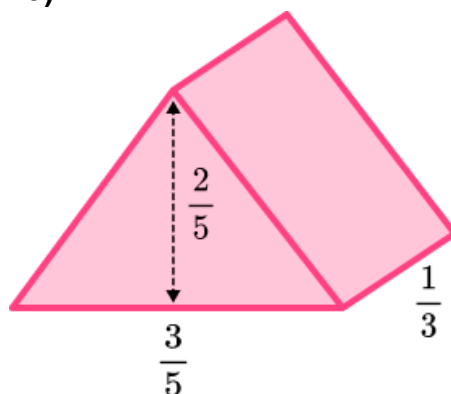
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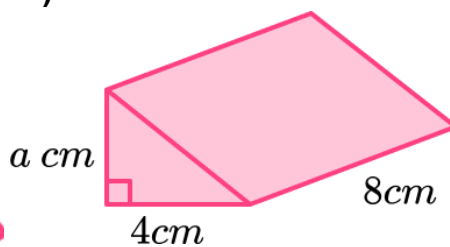
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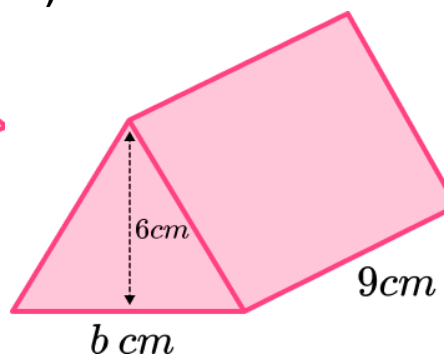
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11)



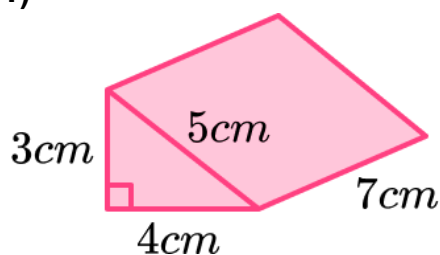
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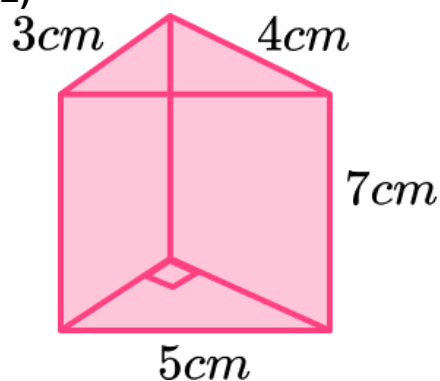
## Group B - Surface area

Work out the surface area of each triangular prism

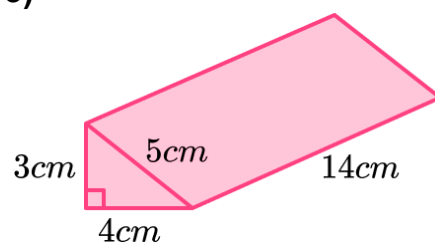
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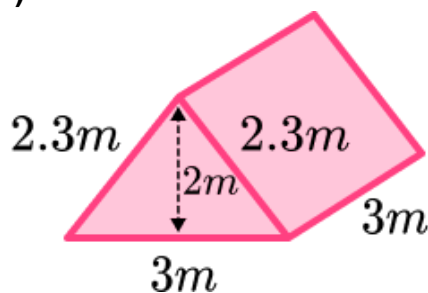
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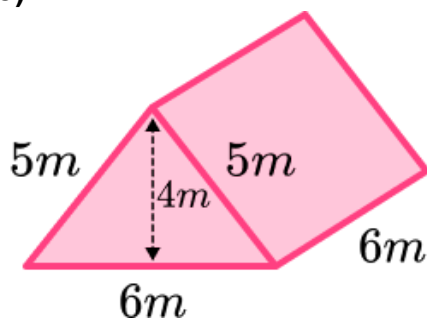
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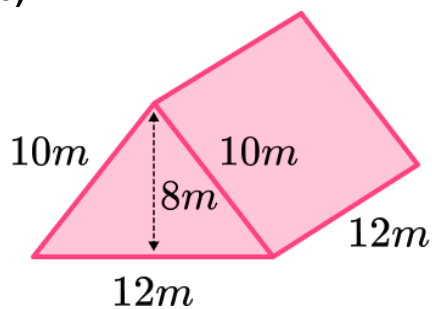
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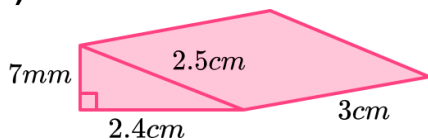
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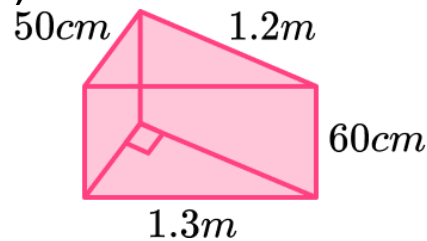
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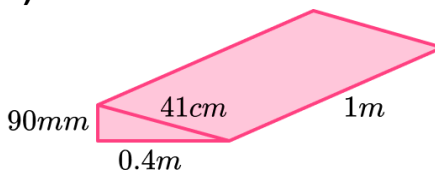
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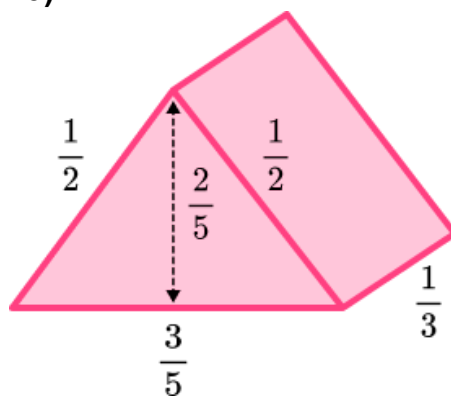
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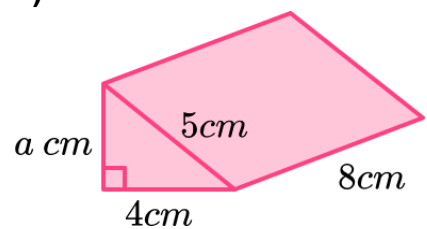
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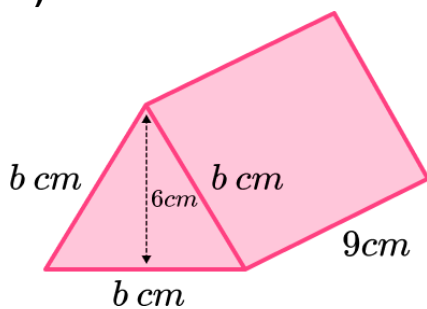
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11)



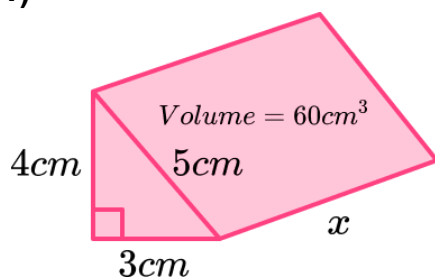
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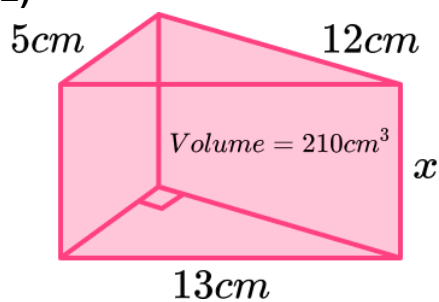
### Group C - Working backwards/multiple steps

Find the length labelled  $x$  and the surface area for each triangular prism

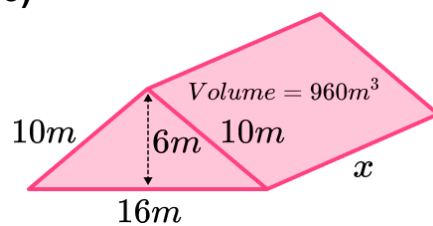
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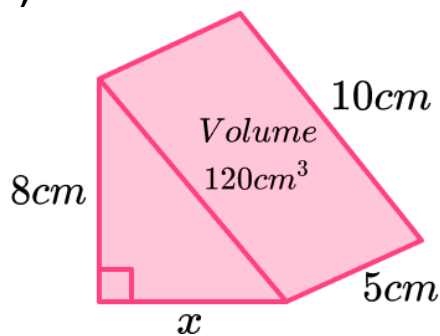
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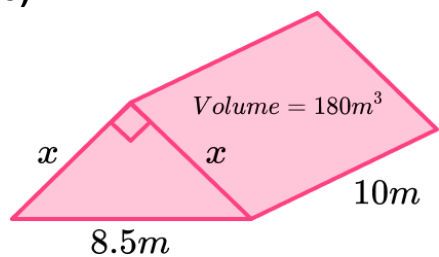
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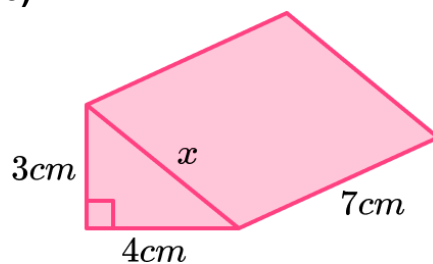
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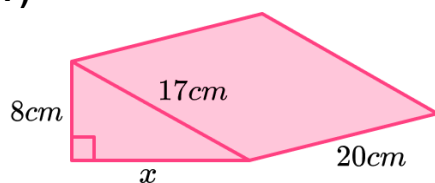
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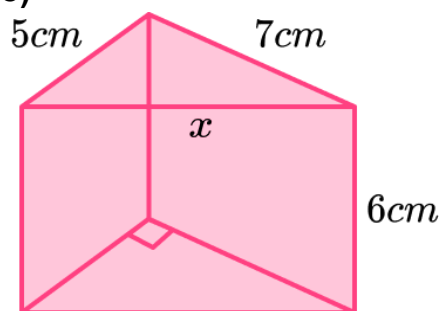
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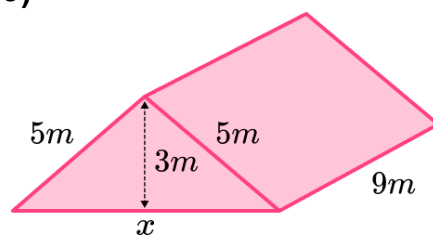
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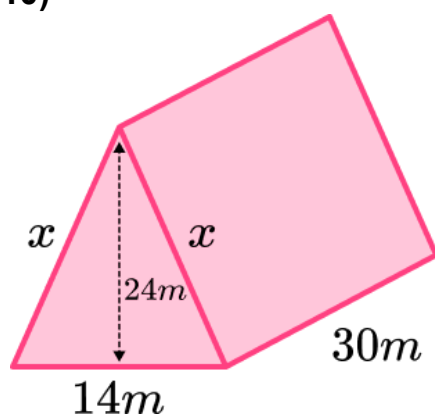
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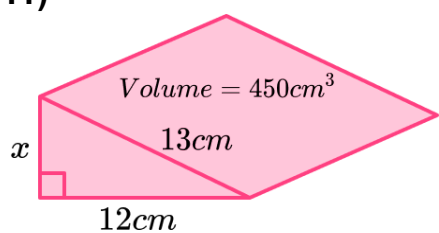
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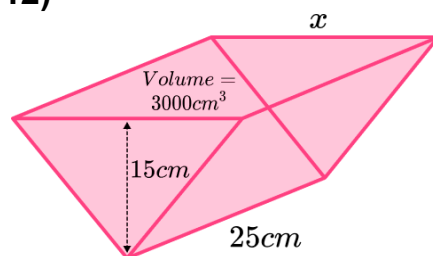
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11)



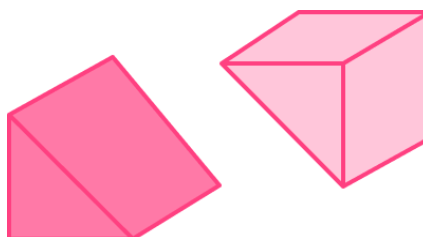
12)



## Volume and Surface Area of Triangular Prisms - Worksheet

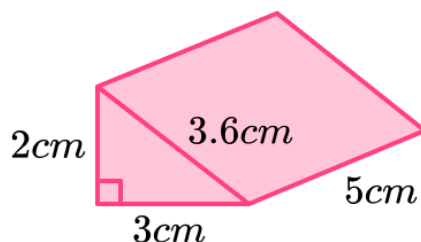
### Applied

- 1) (a) A cube with side length  $10\text{cm}$  is cut in half diagonally. Find the volume of one half of the cube.

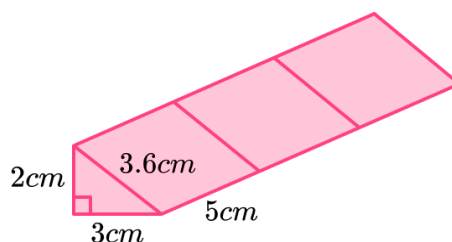


- (b) Find the surface area of one half of the cube.

- 2) (a) Work out the volume and surface area of this triangular prism:

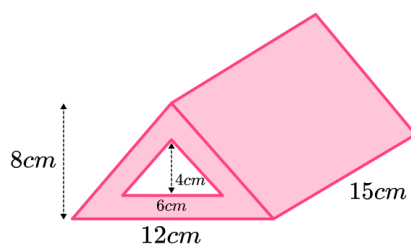


- (b) Three identical triangular prisms are joined together. What is the volume of the prism formed?

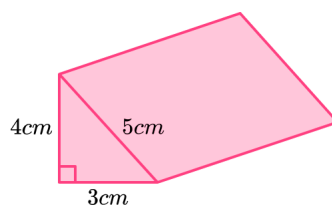


- (c) What is the surface area of the prism formed?

- 3) This triangular prism has a hole through its centre. Work out the volume of the solid shape.

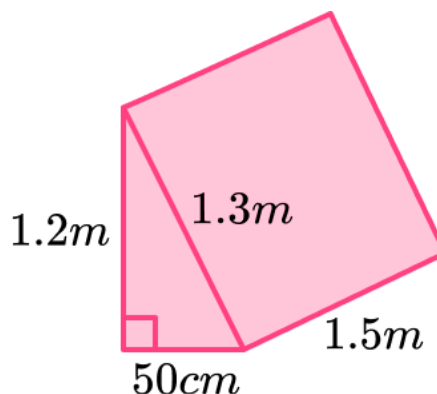


- 4) The surface area of this triangular prism is  $132\text{cm}^2$ . Work out the length of the prism.



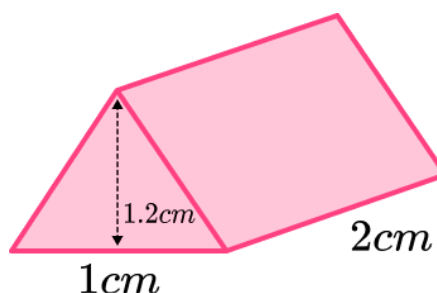
**Volume and Surface Area of Triangular Prisms - Exam Questions**

- 1) Work out the surface area of this triangular prism. Give your answer in  $m^2$ .



.....  
(3 marks)

- 2) (a) Work out the volume of this triangular prism.



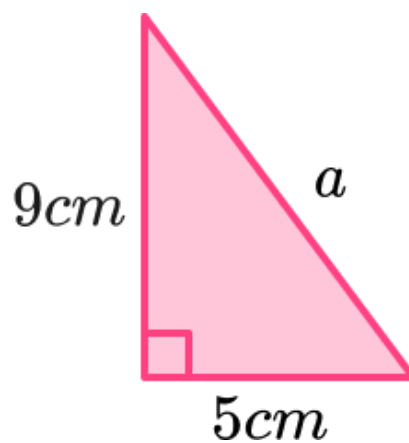
.....  
(2)

- (b) The prism is made from gold, which has a density of  $19.32g/cm^3$ . Gold is currently valued at £46 per gram. What is the value of the prism?

.....  
(2)  
(4 marks)

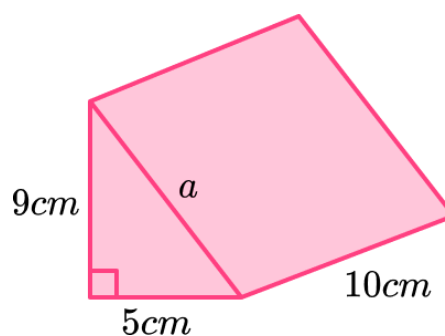
- 3) (a) Work out the length of the side labelled  $a$ .

.....  
(2)



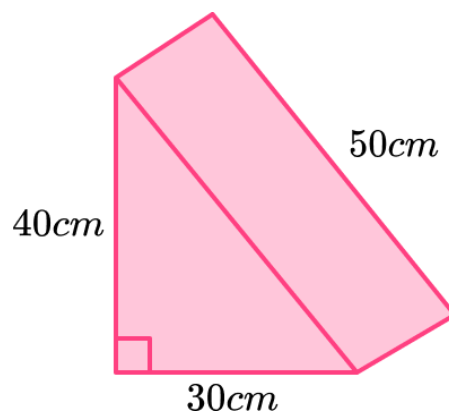
- (b) Hence find the surface area of this triangular prism.

.....  
(3)  
(5 marks)

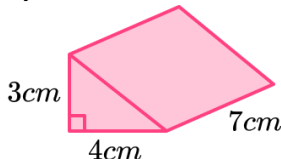
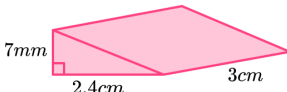
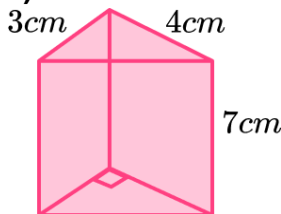
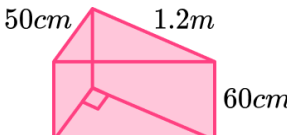
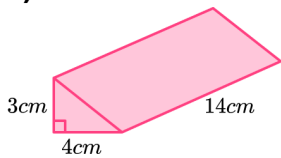
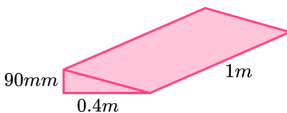
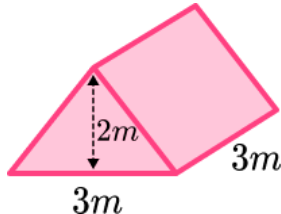
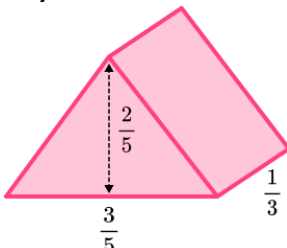
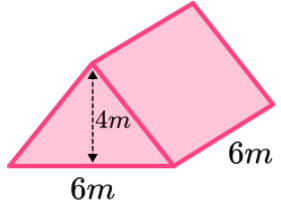
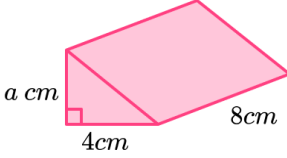


- 4) The volume of this triangular prism is  $6000\text{mm}^3$ . What is the surface area of the prism?

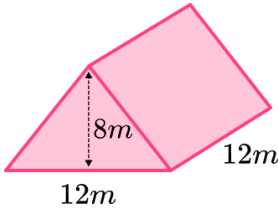
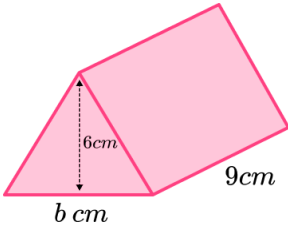
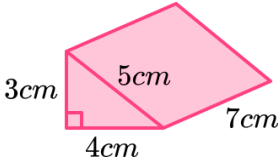
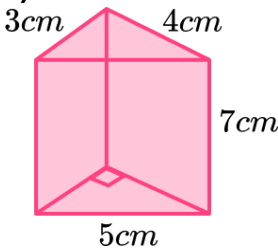
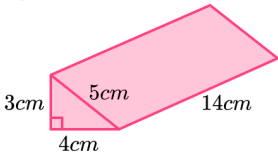
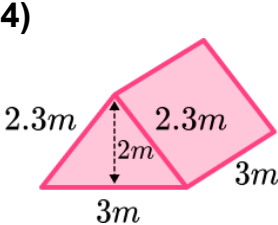
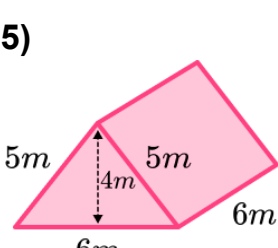
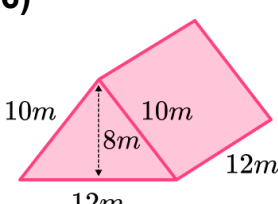
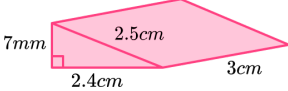
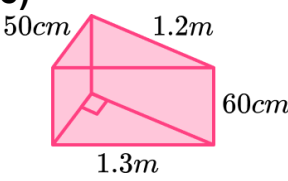
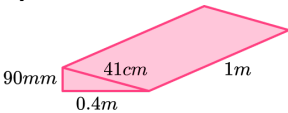
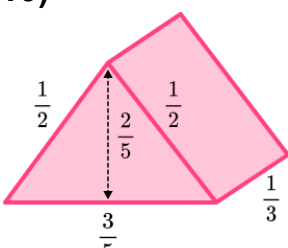
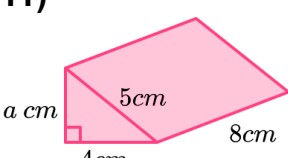
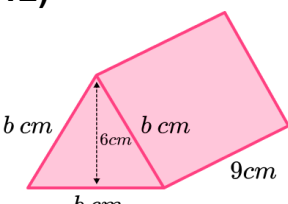
.....  
(5 marks)



## Volume and Surface Area of Triangular Prisms - Answers

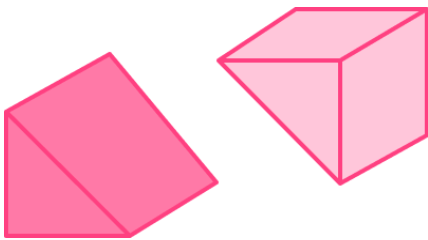
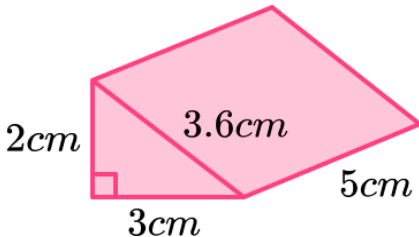
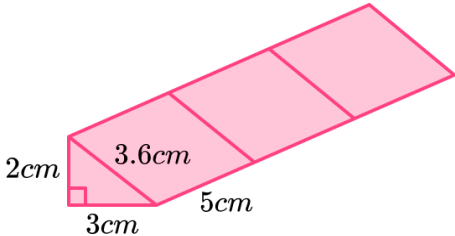
	Question	Answer	
Group A	Skill Questions		
	Work out the volume of each triangular prism		
	<p><b>1)</b></p> 	<p><b>7)</b></p> 	<p><b>1)</b> <math>42\text{cm}^3</math></p> <p><b>7)</b> <math>2520\text{mm}^3</math> or <math>2.52\text{cm}^3</math></p>
	<p><b>2)</b></p> 	<p><b>8)</b></p> 	<p><b>2)</b> <math>42\text{cm}^3</math></p> <p><b>8)</b> <math>180000\text{cm}^3</math> or <math>0.18\text{m}^3</math></p>
	<p><b>3)</b></p> 	<p><b>9)</b></p> 	<p><b>3)</b> <math>84\text{cm}^3</math></p> <p><b>9)</b> <math>18000\text{cm}^3</math></p>
	<p><b>4)</b></p> 	<p><b>10)</b></p> 	<p><b>4)</b> <math>9\text{m}^3</math></p> <p><b>10)</b> <math>\frac{1}{25}\text{m}^3</math></p>
	<p><b>5)</b></p> 	<p><b>11)</b></p> 	<p><b>5)</b> <math>72\text{m}^3</math></p> <p><b>11)</b> <math>16a\text{m}^3</math></p>

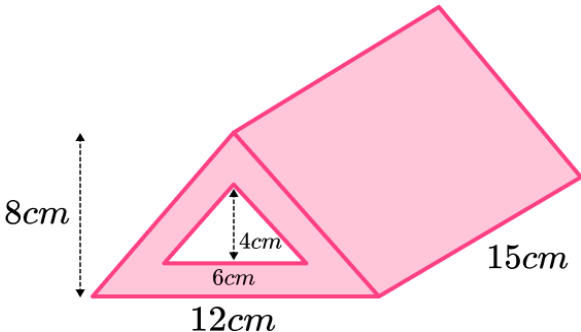
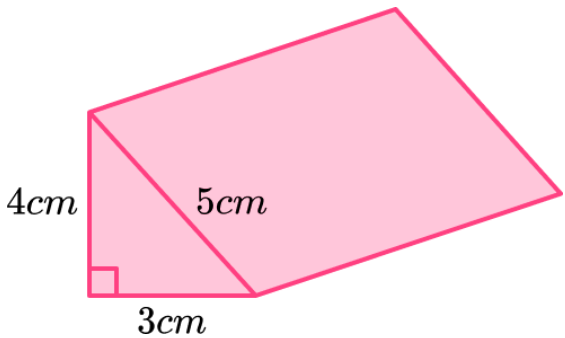


	<b>6)</b> 	<b>12)</b> 	<b>6)</b> $576m^3$	<b>12)</b> $27b\text{ cm}^3$
	Work out the surface area of each triangular prism			
Group B	<b>1)</b>  <b>2)</b>  <b>3)</b>  <b>4)</b>  <b>5)</b>  <b>6)</b> 	<b>7)</b>  <b>8)</b>  <b>9)</b>  <b>10)</b>  <b>11)</b>  <b>12)</b> 	<b>1)</b> $96cm^2$  <b>2)</b> $96cm^2$  <b>3)</b> $180cm^2$  <b>4)</b> $30m^2$  <b>5)</b> $120m^2$  <b>6)</b> $480m^2$	<b>7)</b> $1848mm^2$ or $18.48cm^2$  <b>8)</b> $24000cm^2$ or $2.4m^2$  <b>9)</b> $9360cm^2$  <b>10)</b> $\frac{58}{75}m^2$  <b>11)</b> $10a + 72\text{ cm}^2$  <b>12)</b> $33b$

	Find the length labelled $x$ and the surface area for each triangular prism			
Group C	<p><b>1)</b></p>	<p><b>7)</b></p>	<p><b>1)</b> <math>x = 10cm</math>  <math>SA = 132cm^2</math></p>	<p><b>7)</b> <math>x = 15cm</math>  <math>SA = 920cm^2</math></p>
	<p><b>2)</b></p>	<p><b>8)</b></p>	<p><b>2)</b> <math>x = 7cm</math>  <math>SA = 270cm^2</math></p>	<p><b>8)</b> <math>x = 8.6cm</math>  <math>SA = 158.6cm^2</math></p>
	<p><b>3)</b></p>	<p><b>9)</b></p>	<p><b>3)</b> <math>x = 20m</math>  <math>SA = 816m^2</math></p>	<p><b>9)</b> <math>x = 8m</math>  <math>SA = 186m^2</math></p>
	<p><b>4)</b></p>	<p><b>10)</b></p>	<p><b>4)</b> <math>x = 6cm</math>  <math>SA = 168cm^2</math></p>	<p><b>10)</b> <math>x = 25m</math>  <math>SA = 2256m^2</math></p>
	<p><b>5)</b></p>	<p><b>11)</b></p>	<p><b>5)</b> <math>x = 6m</math>  <math>SA = 241m^2</math></p>	<p><b>11)</b> <math>x = 5cm</math>  <math>SA = 510cm^2</math></p>
	<p><b>6)</b></p>	<p><b>12)</b></p>	<p><b>6)</b> <math>x = 5cm</math>  <math>SA = 96cm^2</math></p>	<p><b>12)</b> <math>x = 16cm</math>  <math>SA = 1490cm^2</math></p>

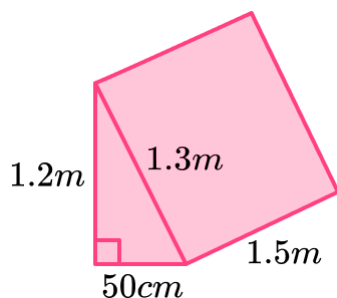
## Volume and Surface Area of Triangular Prisms - Answers

	Question	Answer
	Applied Questions	
1)	<p><b>a)</b> A cube with side length <math>10\text{cm}</math> is cut in half diagonally. Find the volume of one half of the cube.</p> 	<b>a)</b> $500\text{cm}^3$
	<p><b>b)</b> Find the surface area of one half of the cube.</p>	<b>b)</b> $441\text{cm}^2$
2)	<p><b>a)</b> Work out the volume and surface area of this triangular prism:</p> 	<p><b>a)</b> <math>V = 15\text{cm}^3</math> <math>SA = 49\text{cm}^2</math></p>
	<p><b>b)</b> Three identical triangular prisms are joined together. What is the volume of the prism formed?</p> 	<b>b)</b> $45\text{cm}^3$
	<p><b>c)</b> What is the surface area of the prism formed?</p>	<b>c)</b> $135\text{cm}^2$

3)	<p>This triangular prism has a hole through its centre. Work out the volume of the solid shape.</p> 	$540\text{cm}^3$
4)	<p>The surface area of this triangular prism is <math>144\text{cm}^2</math>. Work out the length of the prism.</p> 	$11\text{cm}$

## Volume and Surface Area of Triangular Prisms - Mark Scheme

- 1) Work out the surface area of this triangular prism. Give your answer in  $m^2$ . .....  
**(3 marks)**



$$50cm = 0.5m \text{ (1)}$$

$$\frac{1}{2} \times 0.5 \times 1.2 = 0.3 \text{ (1)}$$

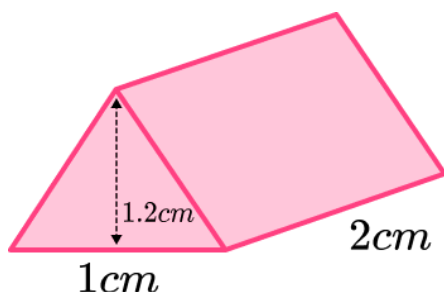
$$1.5 \times 0.5 = 0.75$$

$$1.5 \times 1.2 = 1.8$$

$$1.5 \times 1.3 = 1.95$$

$$0.3 + 0.3 + 0.75 + 1.8 + 1.95 = 5.1m^2 \text{ (1)}$$

- 2) (a) Work out the volume of this triangular prism. .....  
**(2)**



Area of triangle:

$$\frac{1}{2} \times 1 \times 1.2 = 0.6 \text{ (1)}$$

$$\text{Volume: } 0.6 \times 2 = 1.2cm^3 \text{ (1)}$$

- (b) The prism is made from gold, which has a density of  $19.32g/cm^3$ . Gold is currently valued at £46 per gram. What is the value of the prism? .....  
**(2)**  
**(4 marks)**

$$1.2 \times 19.32 = 23.184g \text{ (1)}$$

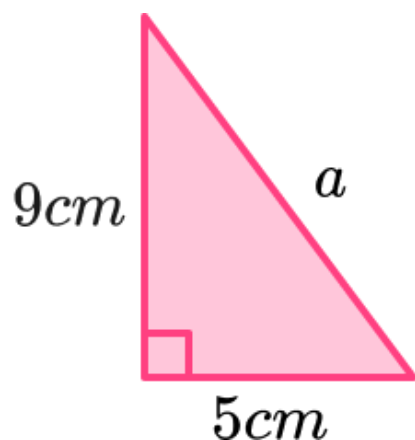
$$23.184 \times 46 = £1066.46 \text{ (1)}$$

- 3) (a) Work out the length of the side labelled  $a$ .

$$a^2 = 9^2 + 5^2 \text{ (1)}$$

.....  
(2)

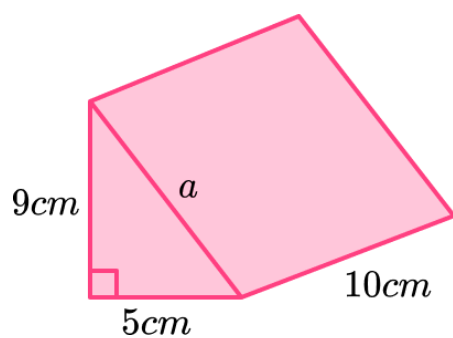
$$a = 10.3 \text{ cm (1)}$$



- (b) Hence find the surface area of this triangular prism.

$$\frac{1}{2} \times 9 \times 5 = 22.5 \text{ (1)}$$

.....  
(3)  
(5 marks)



$$\begin{aligned} 10 \times 5 &= 50 \\ 10 \times 9 &= 90 \\ 10 \times 10.3 &= 103 \\ \text{(1)} \end{aligned}$$

$$22.5 + 22.5 + 50 + 90 + 103 = 288 \text{ cm}^2 \text{ (1)}$$

4)

The volume of this triangular prism is  $6000\text{mm}^3$ . What is the surface area of the prism?

$$\frac{1}{2} \times 40 \times 30 = 600 \text{ (1)}$$

.....  
(5 marks)

$$6000 = 600 \times l \text{ (1)}$$

$$l = 10\text{cm} \text{ (1)}$$

$$10 \times 30 = 300$$

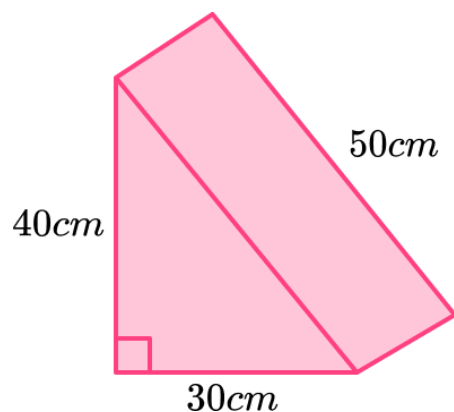
$$10 \times 40 = 400$$

$$10 \times 50 = 500$$

(1)

$$600 + 600 + 300 + 400 + 500 = 2400\text{cm}^2$$

(1)



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