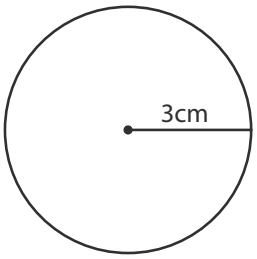
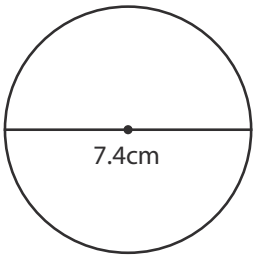
Area of a Circle

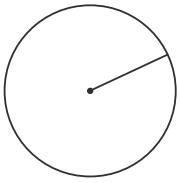
1. Calculate the area of the circle, rounding your answer to one decimal place.

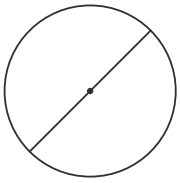


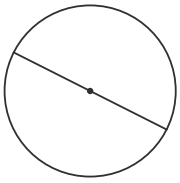
2. Calculate the area of the circle, rounding your answer to one decimal place.

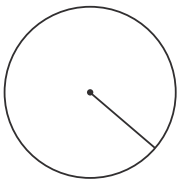


In questions three to six, the area of each circle is given. Calculate the length of the diameter or radius as shown in each circle, rounding your answers to one decimal place.

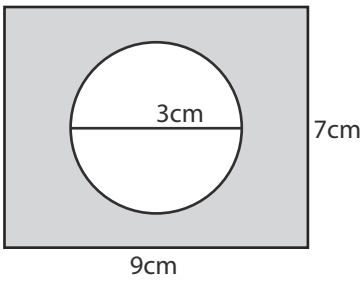
3.  $A = 17cm^2$

4.  $A = 13.2cm^2$

5.  $A = 22.14mm^2$

6.  $A = 399.7m^2$

7. Calculate the shaded area of the shape, rounding your answer to three significant figures.



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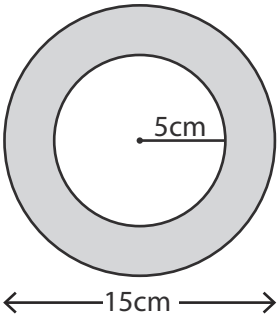
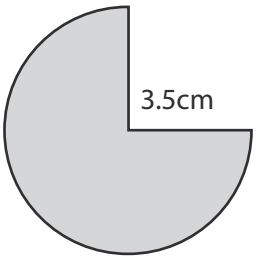


9. Calculate the area of the shape, rounding your answer to two decimal places.

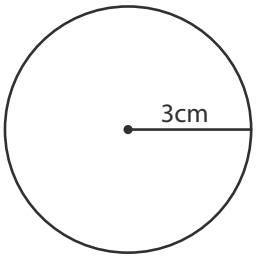


10. A 2p coin has a diameter of 26mm and a 5p coin has a radius of 0.85cm. Ben has 2p and 5p coins with a total value of 12p.

    Calculate the total area of these coins, giving your answer in square centimetres. Give your answer in terms of π.

Area of a Circle Answers

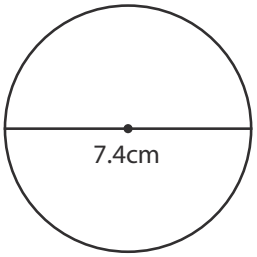
1. Calculate the area of the circle, rounding your answer to one decimal place.



$A = \pi \times 3^2$

$A = 28.3cm^2$

2. Calculate the area of the circle, rounding your answer to one decimal place.



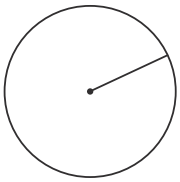
$7.4 \div 2 = 3.7$

$A = \pi \times 3.7^2$

$A = 43.0cm^2$

In questions three to six, the area of each circle is given. Calculate the length of the diameter or radius as shown in each circle, rounding your answers to one decimal place.

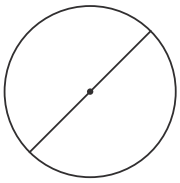
3.



$A = 17cm^2$

$\text{Radius} = \sqrt{\frac{17}{\pi}} = 2.3cm$

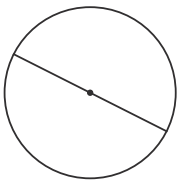
4.



$A = 13.2cm^2$

$\text{Diameter} = 2\left(\sqrt{\frac{13.2}{\pi}}\right) = 4.1cm$

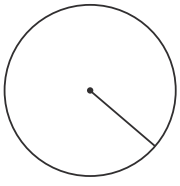
5.



$A = 22.14mm^2$

$\text{Diameter} = 2\left(\sqrt{\frac{22.14}{\pi}}\right) = 5.3mm$

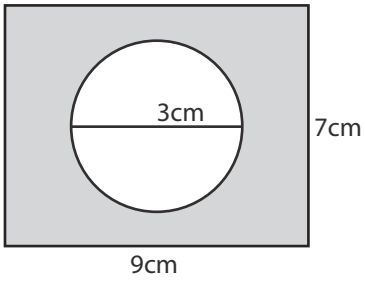
6.



$A = 399.7m^2$

$\text{Radius} = \sqrt{\frac{399.7}{\pi}} = 11.3m$

7. Calculate the shaded area of the shape, rounding your answer to three significant figures.

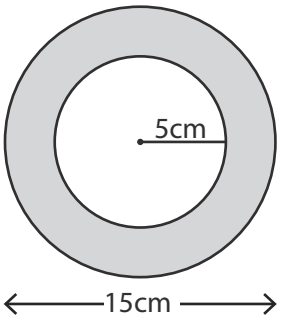


Area of rectangle = $9 \times 7 = 63\text{cm}^2$

Area circle = $\pi \times 1.5^2 = 7.068\ldots$

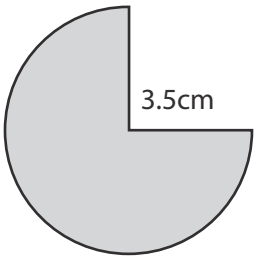
Shaded area = $63 - 7.068\ldots = 55.9\text{cm}^2$ (3s.f.)

8. Calculate the shaded area of the shape, rounding your answer to three significant figures.



$(\pi \times 7.5^2) - (\pi \times 5^2) = 98.2\text{cm}^2$

9. Calculate the area of the shape, rounding your answer to two decimal places.



$\frac{3}{4} \times \pi \times 3.5^2 = 28.86\text{cm}^2$

10. A 2p coin has a diameter of 26mm and a 5p coin has a radius of 0.85cm. Ben has 2p and 5p coins with a total value of 12p.

Calculate the total area of these coins, giving your answer in square centimetres. Give your answer in terms of π.

12p is $2 \times 5\text{p} + 1 \times 2\text{p}$

26mm = 2.6cm

Area of 5p: $\pi \times 0.85^2 = 0.7225\pi$

Area of 2p: $\pi \times 1.3^2 = 1.69\pi$

Total area of 12p = $0.7225\pi + 0.7225\pi + 1.69\pi = 3.135\pi\text{cm}^2$

Area of a Circle

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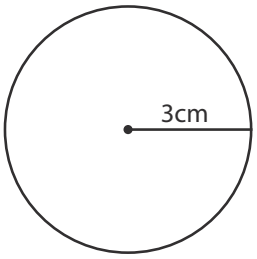

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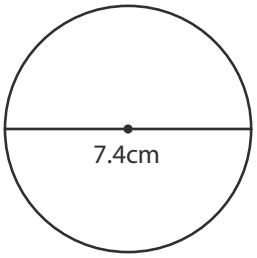

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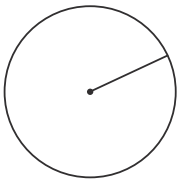
3. 

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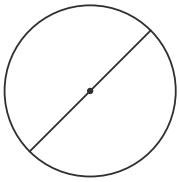
4. 

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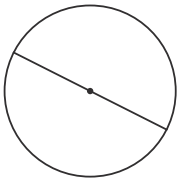
5. 

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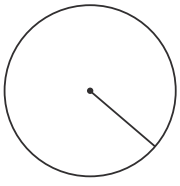
6. 

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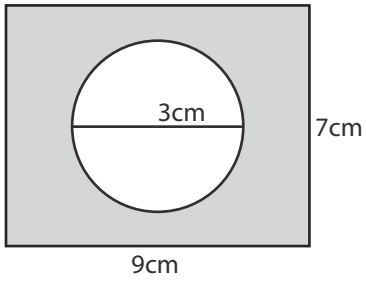

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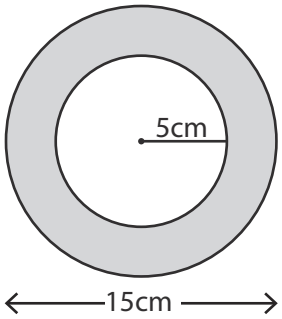

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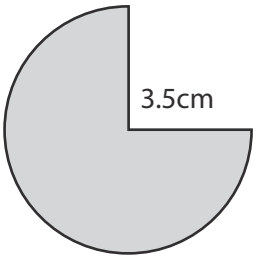

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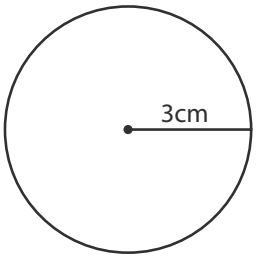

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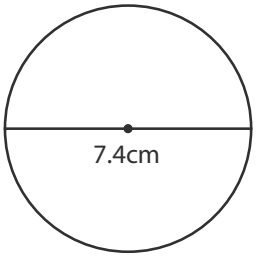

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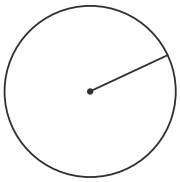

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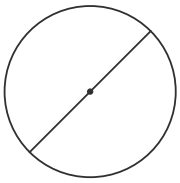

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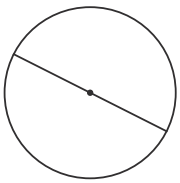

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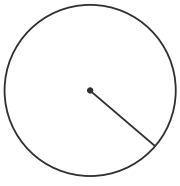

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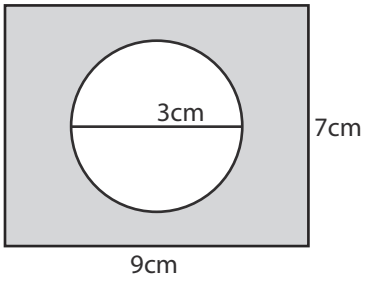

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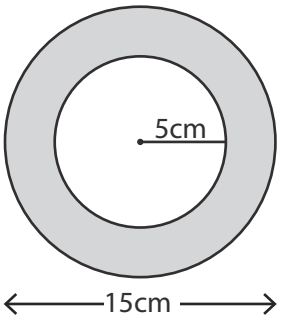

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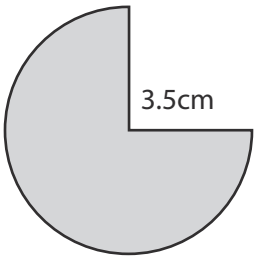

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Area of 5p: $\pi \times 0.85^2 = 0.7225\pi$

Area of 2p: $\pi \times 1.3^2 = 1.69\pi$

Total area of 12p = $0.7225\pi + 0.7225\pi + 1.69\pi = 3.135\pi\text{cm}^2$

Area of a Parallelogram

Calculate the area of each parallelogram, giving your answers in square centimetres.

Question	Base	Vertical Height	Length of Sloping Sides	Area
1.	6cm	3cm	4cm	
2.	5cm	4.5cm	4.8cm	
3.	65mm	7cm	8cm	

Calculate the missing measurement for each parallelogram.

Question	Area	Base	Vertical Height
4.	$35cm^2$	10cm	_____cm
5.	$12m^2$	_____m	4.8m
6.	$94.5cm^2$	0.045m	_____cm

7. A rhombus has a perimeter of 22cm and an area of $24.75cm^2$. Calculate its vertical height.

8. A wall in the shape of a rhombus has a perimeter of 25m and a vertical height of four metres. Calculate its area.

9. Six rhombuses are tessellated to make a mat in the shape of a parallelogram. There are three rhombuses in each row and the longest side is the base of the mat. The base of the mat is six metres in length and the area of each rhombus is three square metres. Calculate the vertical height of the mat.

10. The area of a parallelogram is $32cm^2$. Its vertical height is double the length of its base. Calculate its vertical height.

Area of a Parallelogram Answers

Calculate the area of each parallelogram, giving your answers in square centimetres.

Question	Base	Vertical Height	Length of Sloping Sides	Area
1.	6cm	3cm	4cm	$6 \times 3 = 18\text{cm}^2$
2.	5cm	4.5cm	4.8cm	$5 \times 4.5 = 22.5\text{cm}^2$
3.	65mm	7cm	8cm	$6.5 \times 7 = 45.5\text{cm}^2$

Calculate the missing measurement for each parallelogram.

Question	Area	Base	Vertical Height
4.	35cm^2	10cm	$35 \div 10 = 3.5\text{cm}$
5.	12m^2	$12 \div 4.8 = 2.5\text{m}$	4.8m
6.	94.5cm^2	0.045m	$94.5 \div 4.5 = 21\text{cm}$

7. A rhombus has a perimeter of 22cm and an area of 24.75cm^2. Calculate its vertical height.

   $22 \div 4 = 5.5\text{cm}$

   $24.75 \div 5.5 = 4.5\text{cm}$

8. A wall in the shape of a rhombus has a perimeter of 25m and a vertical height of four metres. Calculate its area.

   $25 \div 4 = 6.25\text{m}$

   $6.25 \times 4 = 25\text{m}^2$

9. Six rhombuses are tessellated to make a mat in the shape of a parallelogram. There are three rhombuses in each row and the longest side is the base of the mat. The base of the mat is six metres in length and the area of each rhombus is three square metres. Calculate the vertical height of the mat.

   $6 \div 3 = 2\text{m}$ base length of each rhombus.

   $3 \div 2 = 1.5\text{m}$ vertical height for each rhombus.

   If three rhombuses are in a row, then the mat must have a height of two rhombuses.

   The vertical height of the mat is $1.5 \times 2 = 3\text{m}$

10. The area of a parallelogram is 32cm^2. Its vertical height is double the length of its base. Calculate its vertical height.

    Let $\boldsymbol{b}$ represent the length of the base (in centimetres).

    $\boldsymbol{b} \times 2\boldsymbol{b} = 32\text{cm}^2$

    $2\boldsymbol{b}^2 = 32\text{cm}^2$

    $\boldsymbol{b}^2 = 16\text{cm}$

    $\boldsymbol{b} = 4\text{cm}$

    base = 4cm, vertical height = 8cm

Area of a Parallelogram

Calculate the area of each parallelogram, giving your answers in square centimetres.

Question	Base	Vertical Height	Length of Sloping Sides	Area
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Question	Area	Base	Vertical Height
4.	35cm^2	10cm	$35 \div 10 = 3.5\text{cm}$
5.	12m^2	$12 \div 4.8 = 2.5\text{m}$	4.8m
6.	94.5cm^2	0.045m	$94.5 \div 4.5 = 21\text{cm}$

7. A rhombus has a perimeter of 22cm and an area of 24.75cm^2. Calculate its vertical height.

   $22 \div 4 = 5.5\text{cm}$

   $24.75 \div 5.5 = 4.5\text{cm}$

8. A wall in the shape of a rhombus has a perimeter of 25m and a vertical height of four metres. Calculate its area.

   $25 \div 4 = 6.25\text{m}$

   $6.25 \times 4 = 25\text{m}^2$

9. Six rhombuses are tessellated to make a mat in the shape of a parallelogram. There are three rhombuses in each row and the longest side is the base of the mat. The base of the mat is six metres in length and the area of each rhombus is three square metres. Calculate the vertical height of the mat.

   $6 \div 3 = 2\text{m}$ base length of each rhombus.

   $3 \div 2 = 1.5\text{m}$ vertical height for each rhombus.

   If three rhombuses are in a row, then the mat must have a height of two rhombuses.

   The vertical height of the mat is $1.5 \times 2 = 3\text{m}$

10. The area of a parallelogram is 32cm^2. Its vertical height is double the length of its base. Calculate its vertical height.

    Let $\boldsymbol{b}$ represent the length of the base (in centimetres).

    $\boldsymbol{b} \times 2\boldsymbol{b} = 32\text{cm}^2$

    $2\boldsymbol{b}^2 = 32\text{cm}^2$

    $\boldsymbol{b}^2 = 16\text{cm}$

    $\boldsymbol{b} = 4\text{cm}$

    base = 4cm, vertical height = 8cm

Area of a Rectangle

Calculate the area of each rectangle. Give each answer in square centimetres.

Question	Length	Width	Area
1.	5cm	6cm	
2.	4cm	4.5cm	
3.	35mm	3cm	

Calculate the missing side of each rectangle.

Question	Area	Length	Width
4.	$28cm^2$	4cm	_____cm
5.	$5m^2$	_____m	2.5m
6.	$32.2cm^2$	0.092m	_____cm

7. A rectangular football pitch is 95 metres long and 60 metres wide. Calculate its area, stating the units to your answer.

8. The surface of a pool table has a width of one and a half metres and a length two and a half times the value of the width. Calculate the area of the surface of the pool table.

9. A square has an area of $144cm^2$. Calculate its perimeter.

10. A rectangular lawn has a length of five metres and a width of three metres. A square flower bed, with a length of two metres is to be dug in the centre. What area of lawn will be left?

Area of a Rectangle Answers

Calculate the area of each rectangle. Give each answer in square centimetres.

Question	Length	Width	Area
1.	5cm	6cm	$5 \times 6 = 30cm^2$
2.	4cm	4.5cm	$4 \times 4.5 = 18cm^2$
3.	35mm	3cm	$3.5 \times 3 = 10.5cm^2$

Calculate the missing side of each rectangle.

Question	Area	Length	Width
4.	$28cm^2$	4cm	$28 \div 4 = 7cm$
5.	$5m^2$	$5 \div 2.5 = 2m$	2.5m
6.	$32.2cm^2$	0.092m	$32.2 \div 9.2 = 3.5cm$

7. A rectangular football pitch is 95 metres long and 60 metres wide. Calculate its area, stating the units to your answer.

   $95 \times 60 = 5700m^2$

8. The surface of a pool table has a width of one and a half metres and a length two and a half times the value of the width. Calculate the area of the surface of the pool table.

   $1.5 \times 2.5 = 3.75m$

   $1.5 \times 3.75 = 5.625m^2$

9. A square has an area of $144cm^2$. Calculate its perimeter.

   $\sqrt{144} = 12cm$

   $12 \times 4 = 48cm$

10. A rectangular lawn has a length of five metres and a width of three metres. A square flower bed, with a length of two metres is to be dug in the centre. What area of lawn will be left?

    Area of the lawn: $5 \times 3 = 15m^2$

    Area of the flower bed: $2 \times 2 = 4m^2$

    $15 - 4 = 11m^2$

Area of a Rectangle

Calculate the area of each rectangle. Give each answer in square centimetres.

Question	Length	Width	Area
1.	5cm	6cm	
2.	4cm	4.5cm	
3.	35mm	3cm	

Calculate the missing side of each rectangle.

Question	Area	Length	Width
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6.	$32.2cm^2$	0.092m	_____cm

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Area of a Rectangle Answers

Calculate the area of each rectangle. Give each answer in square centimetres.

Question	Length	Width	Area
1.	5cm	6cm	$5 \times 6 = 30cm^2$
2.	4cm	4.5cm	$4 \times 4.5 = 18cm^2$
3.	35mm	3cm	$3.5 \times 3 = 10.5cm^2$

Calculate the missing side of each rectangle.

Question	Area	Length	Width
4.	$28cm^2$	4cm	$28 \div 4 = 7cm$
5.	$5m^2$	$5 \div 2.5 = 2m$	2.5m
6.	$32.2cm^2$	0.092m	$32.2 \div 9.2 = 3.5cm$

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   $1.5 \times 3.75 = 5.625m^2$

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    Area of the lawn: $5 \times 3 = 15m^2$

    Area of the flower bed: $2 \times 2 = 4m^2$

    $15 - 4 = 11m^2$

Area of a Trapezium

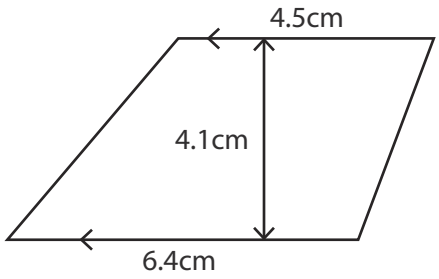
Calculate the area of each trapezium, giving your answers in square centimetres.

Question	Length (a)	Length (b)	Vertical Height (h)	Area
1.	4cm	6cm	3cm	
2.	2.5cm	5cm	6.5cm	
3.	34mm	4.5cm	7.25cm	

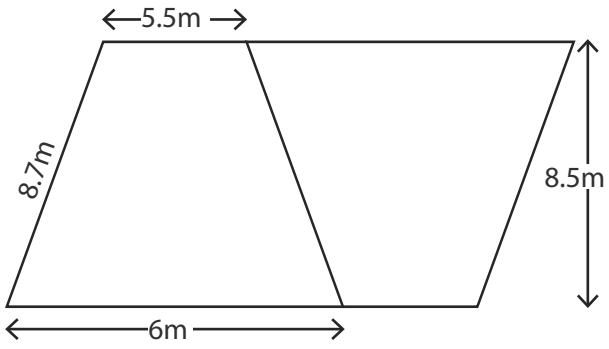
Calculate the missing measurement for each trapezium.

Question	Area	Length (a)	Length (b)	Vertical Height
4.	$15.75cm^2$	3cm	4cm	_____cm
5.	$74.42m^2$	_____m	8m	12.2m
6.	$154.5cm^2$	8.1cm	_____cm	150mm

7. Calculate the area of the shape.

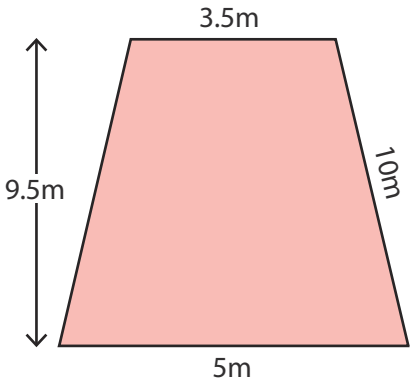


8. Two congruent trapezia are placed together to make a different shape. Calculate the area of the new shape.



9. Calculate the perimeter of the shape in question eight.

10. Tymon wants to paint a feature wall in his office in a deluxe red paint. The paint he wants is available in five-litre tins, each of which cover six square metres in a single coat. The paint costs £6.95 per tin. The wall will need two coats of paint. Calculate the total cost to paint the wall and how many tins Tymon should purchase.



Area of a Trapezium Answers

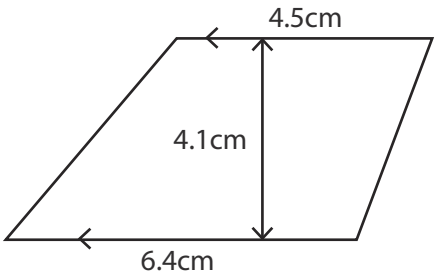
Calculate the area of each trapezium, giving your answers in square centimetres.

Question	Length (a)	Length (b)	Vertical Height (h)	Area
1.	4cm	6cm	3cm	$0.5 \times (4 + 6) \times 3 = 15\text{cm}^2$
2.	2.5cm	5cm	6.5cm	$0.5 \times (2.5 + 5) \times 6.5 = 24.375\text{cm}^2$
3.	34mm	4.5cm	7.25cm	$0.5 \times (3.4 + 4.5) \times 7.25 = 28.64\text{cm}^2$ (2d.p.)

Calculate the missing measurement for each trapezium.

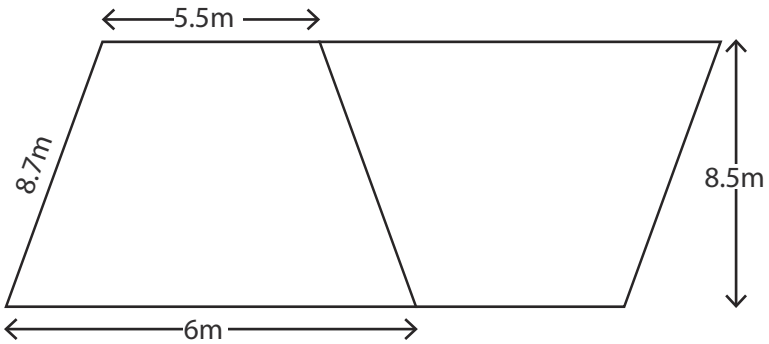
Question	Area	Length (a)	Length (b)	Vertical Height
4.	15.75cm^2	3cm	4cm	4.5cm
5.	74.42m^2	4.2m	8m	12.2m
6.	154.5cm^2	8.1cm	12.5cm	150mm

7. Calculate the area of the shape.



$0.5 \times (4.5 + 6.4) \times 4.1 = 22.345\text{cm}^2$

8. Two congruent trapezia are placed together to make a different shape. Calculate the area of the new shape.



$0.5 \times (5.5 + 6) \times 8.5 = 48.875\text{m}^2$

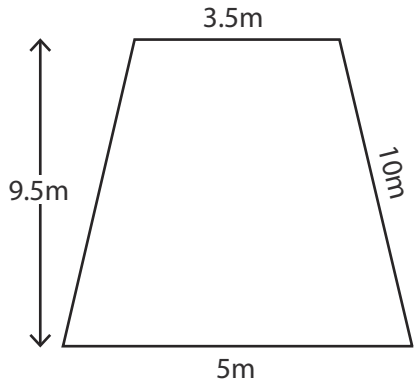
$48.875 \times 2 = 97.75\text{m}^2$

(Alternatively, consider the area of the parallelogram as $(6 + 5.5) \times 8.5$)

9. Calculate the perimeter of the shape in question eight.

$2 \times 6 + 2 \times 5.5 + 2 \times 8.7 = 40.4\text{m}$

10. Tymon wants to paint a feature wall in his office in a deluxe red paint. The paint he wants is available in five-litre tins, each of which cover six square metres in a single coat. The paint costs £6.95 per tin. The wall will need two coats of paint. Calculate the total cost to paint the wall and how many tins Tymon should purchase.



Area of the wall: $0.5 \times (3.5 + 5) \times 9.5 = 40.375\text{m}^2$

Two coats of paint: $40.375 \times 2 = 80.75\text{m}^2$

$80.75 \div 6 = 13.46$ (2d.p.)

He should buy 14 tins.

$14 \times £6.95 = £97.30$

Area of a Trapezium

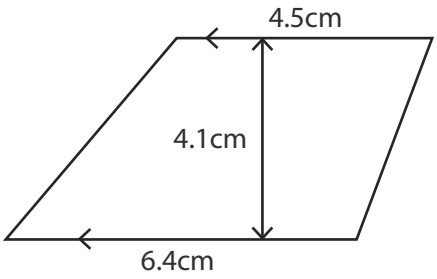
Calculate the area of each trapezium, giving your answers in square centimetres.

Question	Length (a)	Length (b)	Vertical Height (h)	Area
1.	4cm	6cm	3cm	
2.	2.5cm	5cm	6.5cm	
3.	34mm	4.5cm	7.25cm	

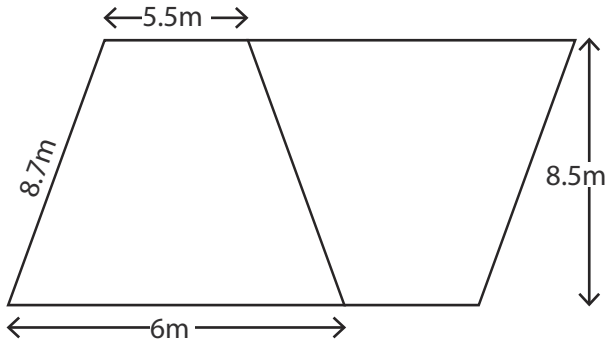
Calculate the missing measurement for each trapezium.

Question	Area	Length (a)	Length (b)	Vertical Height
4.	$15.75cm^2$	3cm	4cm	_____cm
5.	$74.42m^2$	_____m	8m	12.2m
6.	$154.5cm^2$	8.1cm	_____cm	150mm

7. Calculate the area of the shape.



8. Two congruent trapezia are placed together to make a different shape. Calculate the area of the new shape.



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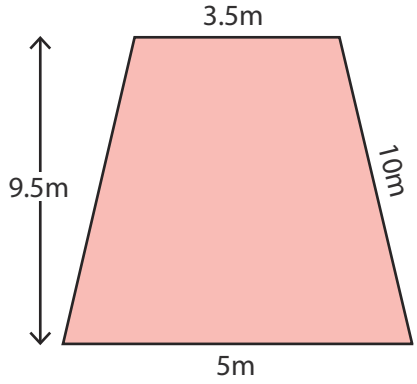

Area of a Trapezium Answers

Calculate the area of each trapezium, giving your answers in square centimetres.

Question	Length (a)	Length (b)	Vertical Height (h)	Area
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3.	34mm	4.5cm	7.25cm	$0.5 \times (3.4 + 4.5) \times 7.25 = 28.64\text{cm}^2$ (2d.p.)

Calculate the missing measurement for each trapezium.

Question	Area	Length (a)	Length (b)	Vertical Height
4.	15.75cm^2	3cm	4cm	4.5cm
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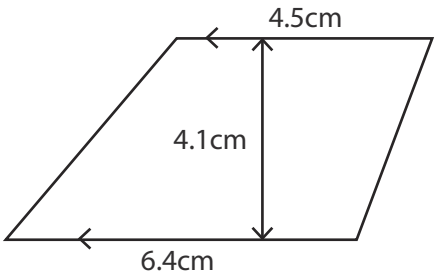

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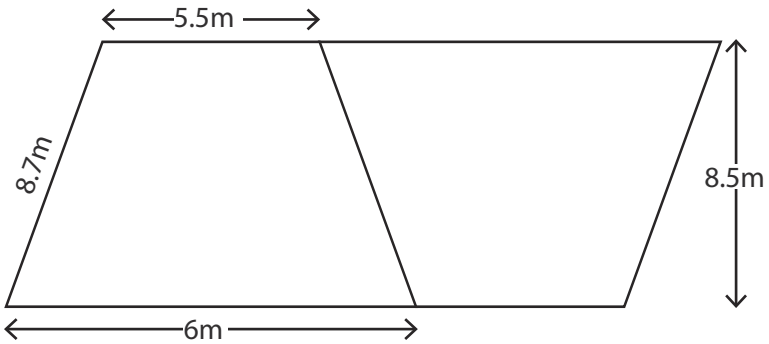

$0.5 \times (5.5 + 6) \times 8.5 = 48.875\text{m}^2$

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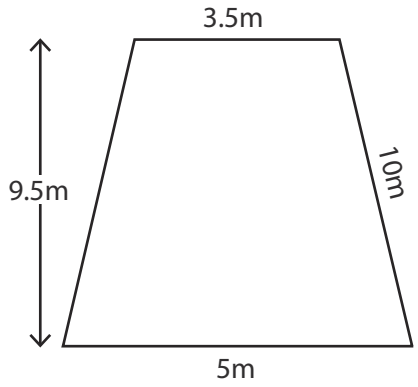


Area of the wall: $0.5 \times (3.5 + 5) \times 9.5 = 40.375\text{m}^2$

Two coats of paint: $40.375 \times 2 = 80.75\text{m}^2$

$80.75 \div 6 = 13.46$ (2d.p.)

He should buy 14 tins.

$14 \times £6.95 = £97.30$

Area of a Triangle

Calculate the area of each triangle, giving your answers in square centimetres.

Question	Base	Vertical Height	Area
1.	3cm	7cm	
2.	2cm	3.5cm	
3.	42mm	5cm	

Calculate the missing measurement for each triangle.

Question	Area	Base	Vertical Height
4.	$30cm^2$	6cm	_____cm
5.	$6.6m^2$	_____m	2.2m
6.	$12.2cm^2$	0.055m	_____cm

7. A right-angled triangle has a base four centimetres in length, a hypotenuse five centimetres in length and its third side is three centimetres long. Calculate the area of the triangle.

8. An isosceles triangle has a base 10cm in length. Its two other sides are 13cm long and its vertical height is 12cm. Calculate its area.

9. The perimeter of a square is 36cm. It is split along its diagonal into two congruent triangles. Calculate the area of one of the triangles.

10. An isosceles triangle is formed by placing two congruent right-angled triangles adjacent to each other. Each of these triangles has a base of 70mm and a vertical height of 8cm. Calculate the area of the isosceles triangle, giving your answer in square centimetres.

Area of a Triangle Answers

Calculate the area of each triangle, giving your answers in square centimetres.

Question	Base	Vertical Height	Area
1.	3cm	7cm	$0.5 \times 3 \times 7 = 10.5\text{cm}^2$
2.	2cm	3.5cm	$0.5 \times 2 \times 3.5 = 3.5\text{cm}^2$
3.	42mm	5cm	$0.5 \times 4.2 \times 5 = 10.5\text{cm}^2$

Calculate the missing measurement for each triangle.

Question	Area	Base	Vertical Height
4.	30cm^2	6cm	$30 \div (6 \times 0.5) = 10\text{cm}$
5.	6.6m^2	$6.6 \div (2.2 \times 0.5) = 6\text{m}$	2.2m
6.	12.2cm^2	0.055m	$12.2 \div (5.5 \times 0.5) = 4.44\text{cm}$ (2d.p.)

7. A right-angled triangle has a base four centimetres in length, a hypotenuse five centimetres in length and its third side is three centimetres long. Calculate the area of the triangle.

   $0.5 \times 3 \times 4 = 6\text{cm}^2$

8. An isosceles triangle has a base 10cm in length. Its two other sides are 13cm long and its vertical height is 12cm. Calculate its area.

   $0.5 \times 10 \times 12 = 60\text{cm}^2$

9. The perimeter of a square is 36cm. It is split along its diagonal into two congruent triangles. Calculate the area of one of the triangles.

   $36 \div 4 = 9\text{cm}$

   $0.5 \times 9 \times 9 = 40.5\text{cm}^2$

10. An isosceles triangle is formed by placing two congruent right-angled triangles adjacent to each other. Each of these triangles has a base of 70mm and a vertical height of 8cm. Calculate the area of the isosceles triangle, giving your answer in square centimetres.

    $0.5 \times 14 \times 8 = 56\text{cm}^2$

Area of a Triangle

Calculate the area of each triangle, giving your answers in square centimetres.

Question	Base	Vertical Height	Area
1.	3cm	7cm	
2.	2cm	3.5cm	
3.	42mm	5cm	

Calculate the missing measurement for each triangle.

Question	Area	Base	Vertical Height
4.	$30cm^2$	6cm	_____cm
5.	$6.6m^2$	_____m	2.2m
6.	$12.2cm^2$	0.055m	_____cm

7. A right-angled triangle has a base four centimetres in length, a hypotenuse five centimetres in length and its third side is three centimetres long. Calculate the area of the triangle.

8. An isosceles triangle has a base 10cm in length. Its two other sides are 13cm long and its vertical height is 12cm. Calculate its area.

9. The perimeter of a square is 36cm. It is split along its diagonal into two congruent triangles. Calculate the area of one of the triangles.

10. An isosceles triangle is formed by placing two congruent right-angled triangles adjacent to each other. Each of these triangles has a base of 70mm and a vertical height of 8cm. Calculate the area of the isosceles triangle, giving your answer in square centimetres.

Area of a Triangle Answers

Calculate the area of each triangle, giving your answers in square centimetres.

Question	Base	Vertical Height	Area
1.	3cm	7cm	$0.5 \times 3 \times 7 = 10.5cm^2$
2.	2cm	3.5cm	$0.5 \times 2 \times 3.5 = 3.5cm^2$
3.	42mm	5cm	$0.5 \times 4.2 \times 5 = 10.5cm^2$

Calculate the missing measurement for each triangle.

Question	Area	Base	Vertical Height
4.	$30cm^2$	6cm	$30 \div (6 \times 0.5) = 10cm$
5.	$6.6m^2$	$6.6 \div (2.2 \times 0.5) = 6m$	2.2m
6.	$12.2cm^2$	0.055m	$12.2 \div (5.5 \times 0.5) = 4.44cm$ (2d.p.)

7. A right-angled triangle has a base four centimetres in length, a hypotenuse five centimetres in length and its third side is three centimetres long. Calculate the area of the triangle.

   $0.5 \times 3 \times 4 = 6cm^2$

8. An isosceles triangle has a base 10cm in length. Its two other sides are 13cm long and its vertical height is 12cm. Calculate its area.

   $0.5 \times 10 \times 12 = 60cm^2$

9. The perimeter of a square is 36cm. It is split along its diagonal into two congruent triangles. Calculate the area of one of the triangles.

   $36 \div 4 = 9cm$

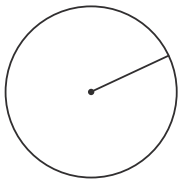
   $0.5 \times 9 \times 9 = 40.5cm^2$

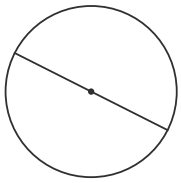
10. An isosceles triangle is formed by placing two congruent right-angled triangles adjacent to each other. Each of these triangles has a base of 70mm and a vertical height of 8cm. Calculate the area of the isosceles triangle, giving your answer in square centimetres.

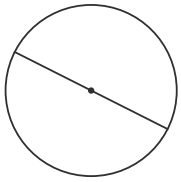
    $0.5 \times 14 \times 8 = 56cm^2$

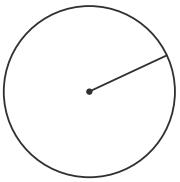
Circumference of a Circle

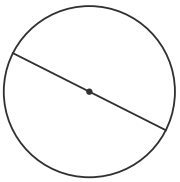
In questions one to five, the circumference of each circle is given. Calculate the length of the diameter or radius as shown in each circle, rounding your answers to two decimal places.

1.  circumference = 31.2cm

2.  circumference = 175cm

3.  circumference = 376.2cm

4.  circumference = 0.44m

5.  circumference = 89.9m

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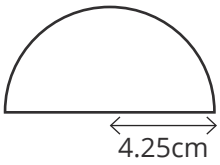
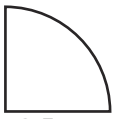
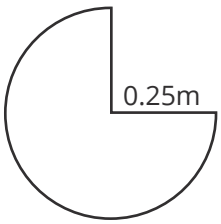
6. 

7. 

8. 

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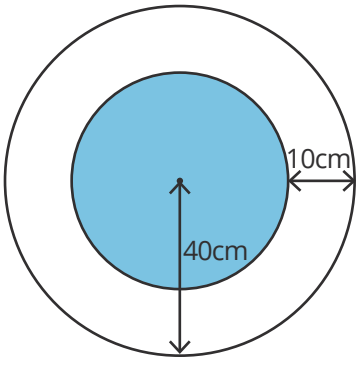
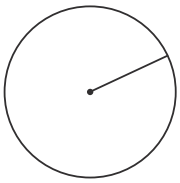
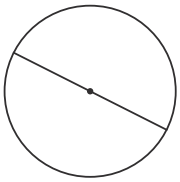


Circumference of a Circle **Answers**

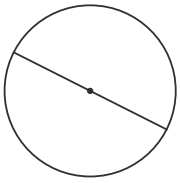
In questions one to five, the circumference of each circle is given. Calculate the length of the diameter or radius as shown in each circle, rounding your answers to two decimal places.

1.  circumference = 31.2cm

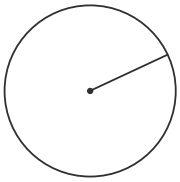
Radius = $\frac{31.2}{2\pi}$ = 4.97cm

2.  circumference = 175cm

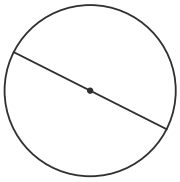
Diameter = $\frac{175}{\pi}$ = 55.70cm

3.  circumference = 376.2cm

Diameter = $\frac{376.2}{\pi}$ = 119.75cm

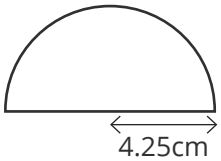
4.  circumference = 0.44m

Radius = $\frac{0.44}{2\pi}$ = 0.07m or 7cm

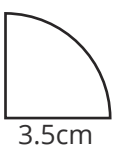
5.  circumference = 89.9m

Diameter = $\frac{89.9}{\pi}$ = 28.62m

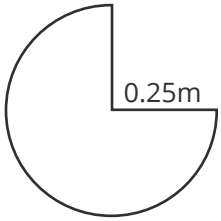
Calculate the perimeter of each shape in questions six to eight, rounding your answers to one decimal place.

6. 

$\frac{2\pi \times 4.25}{2}$ + (2 × 4.25) = 21.9cm

7. 

$\frac{2\pi \times 3.5}{4}$ + (2 × 3.5) = 12.5cm

8. 

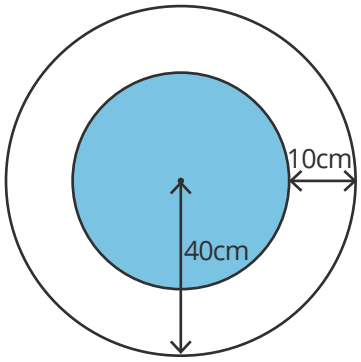
$\frac{3}{4} \times (2\pi \times 0.25) + (2 \times 0.25) = 1.7$m

9. A trundle wheel is a device used to measure distance. Each revolution of the wheel measures a distance of 1m. Calculate the diameter of the wheel, giving your answer in centimetres correct to 2 decimal places.

1m = 100cm

diameter = $\frac{100}{\pi}$ = 31.83cm

10. The diagram shows a pond with a circular border filled with soil. Linda wants to plant tulip bulbs along the circumference of the pond with a minimum distance of 240mm between each one. She says she can plant 7 bulbs. Prove that she is correct.



Diameter of pond = (40 − 10) × 2 = 60cm

Circumference = 60 × π = 188.495...cm

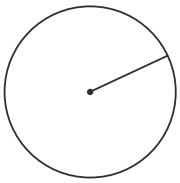
240mm = 24cm

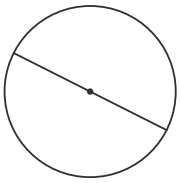
Number of spaces for bulbs = $\frac{188.495...}{24}$ = 7.853...

Yes, she can plant 7 bulbs.

Circumference of a Circle

In questions one to five, the circumference of each circle is given. Calculate the length of the diameter or radius as shown in each circle, rounding your answers to two decimal places.

1. 
circumference = 31.2cm

2. 
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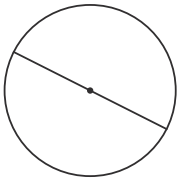
3. 
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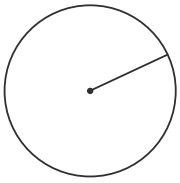
4. 
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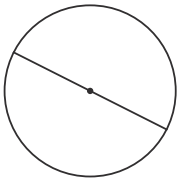
5. 
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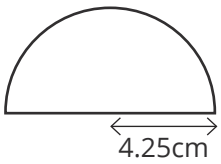
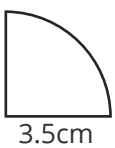
6. 

7. 

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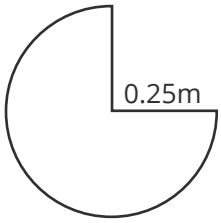

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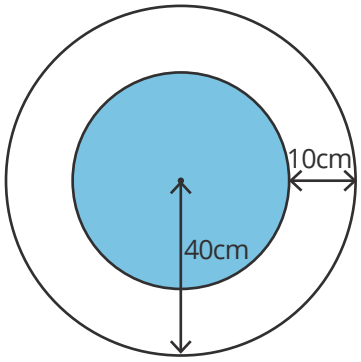

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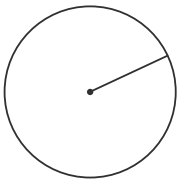
1.  circumference = 31.2cm

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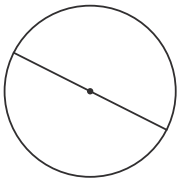
2.  circumference = 175cm

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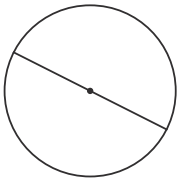
3.  circumference = 376.2cm

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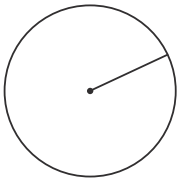
4.  circumference = 0.44m

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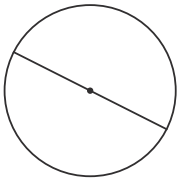
5.  circumference = 89.9m

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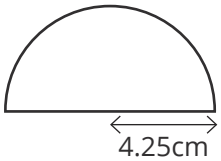
6. 

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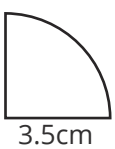
7. 

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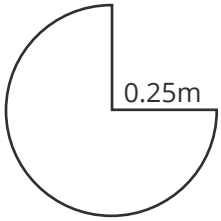
8. 

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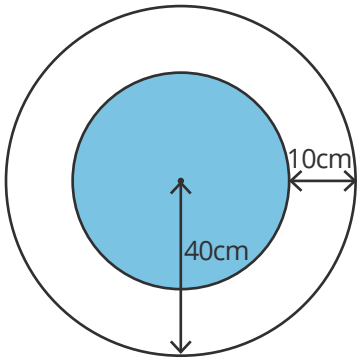

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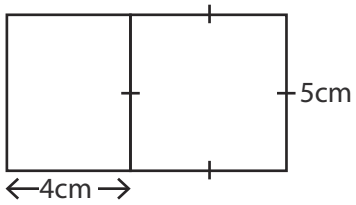
Number of spaces for bulbs = $\frac{188.495...}{24}$ = 7.853...

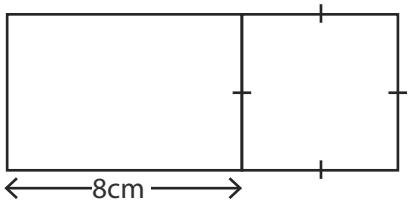
Yes, she can plant 7 bulbs.

Compound Shapes

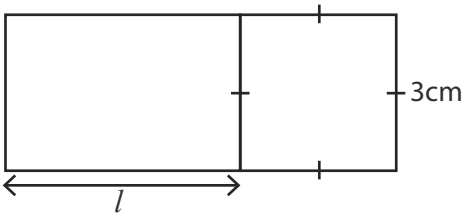
1. The diagram shows a compound shape made up of a rectangle and square. Calculate its area.



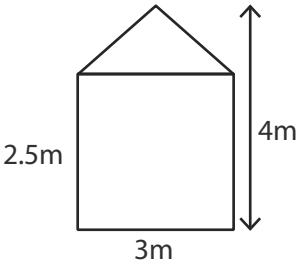
2. The diagram shows a compound shape made up of a rectangle and square. The area of the square is 16cm^2. Calculate the area of the compound shape.



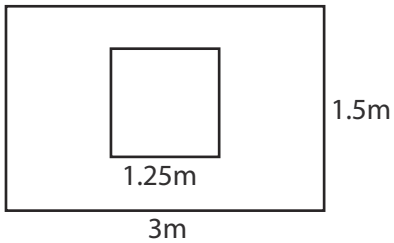
3. The diagram shows a compound shape made up of a rectangle and square. The area of the compound shape is 22.5cm^2. Calculate the value of the length l.



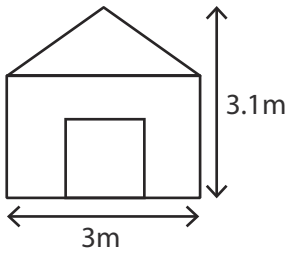
4. The diagram shows a compound shape made up of a rectangle and triangle Calculate the area of the compound shape.



5. A square hole is cut out of a grass lawn in order to plant vegetable seeds. Calculate the area of the lawn that is left over.

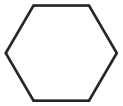


6. The front view of a shed is shown. The rectangular cross-section, including the door, has a total area of 3.6m^2. Calculate the vertical height of the triangular roof.

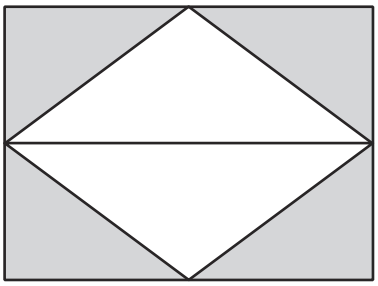


7. Calculate the area of the cross-section of the triangular roof in question 6.

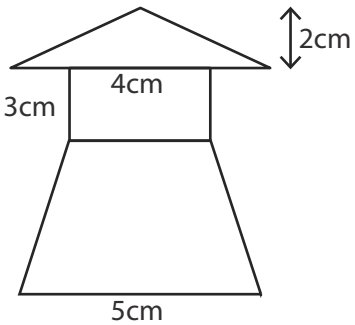
8. A regular hexagon with an area of 32cm^2 is tessellated to form a pattern. How many hexagons are in the pattern if the total area is 480cm^2?



9. A shape is made up of two congruent triangles inscribed in a rectangle. The shape has a total area of 15cm^2 and a horizontal length of 5cm. Calculate the total area of the two triangles.



10. Sammi sketches a rocket out of polygons. The vertical height of the rocket is 10cm and at its widest it is 8cm in length. Calculate the area of the rocket.



Compound Shapes Answers

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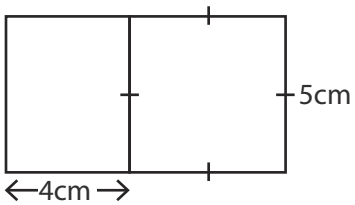
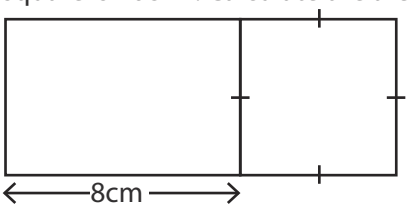


$(4 \times 5) + (5 \times 5) = 45\text{cm}^2$

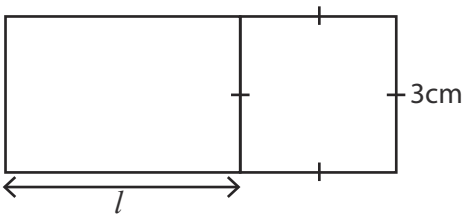
2. The diagram shows a compound shape made up of a rectangle and square. The area of the square is 16cm^2. Calculate the area of the compound shape.



$\sqrt{16} = 4\text{cm}$

$(8 \times 4) + 16 = 48\text{cm}^2$

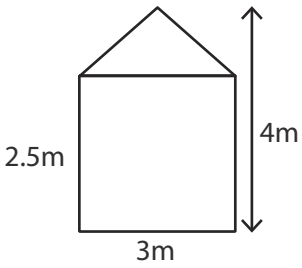
3. The diagram shows a compound shape made up of a rectangle and square. The area of the compound shape is 22.5cm^2. Calculate the value of the length l.



$22.5 - 3^2 = 13.5\text{cm}^2$

$13.5 \div 3 = 4.5\text{cm}$

4. The diagram shows a compound shape made up of a rectangle and triangle Calculate the area of the compound shape.



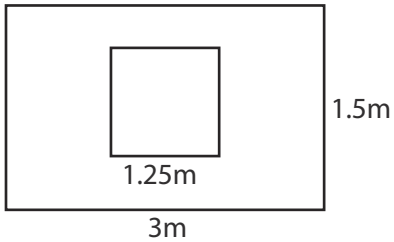
$2.5 \times 3 = 7.5\text{m}^2$

$4 - 2.5 = 1.5\text{m}$

$0.5 \times 3 \times 1.5 = 2.25\text{m}^2$

$7.5 + 2.25 = 9.75\text{m}^2$

5. A square hole is cut out of a grass lawn in order to plant vegetable seeds. Calculate the area of the lawn that is left over.

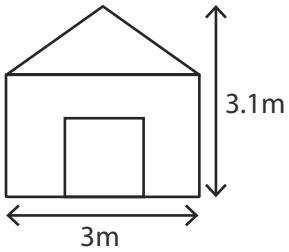


$3 \times 1.5 = 4.5\text{m}^2$

$1.25^2 = 1.5625\text{m}^2$

$4.5 - 1.5625 = 2.94\text{m}^2$ (2d.p.)

6. The front view of a shed is shown. The rectangular cross-section, including the door, has a total area of 3.6m^2. Calculate the vertical height of the triangular roof.



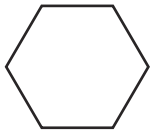
$3.6 \div 3 = 1.2$m

$3.1 - 1.2 = 1.9$m

7. Calculate the area of the cross-section of the triangular roof in question 6.

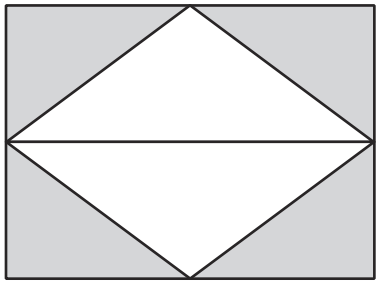
$0.5 \times 1.9 \times 3 = 2.85$m

8. A regular hexagon with an area of 32cm^2 is tessellated to form a pattern. How many hexagons are in the pattern if the total area is 480cm^2?



$480 \div 32 = 15$ hexagons

9. A shape is made up of two congruent triangles inscribed in a rectangle. The shape has a total area of 15cm^2 and a horizontal length of 5cm. Calculate the total area of the two triangles.



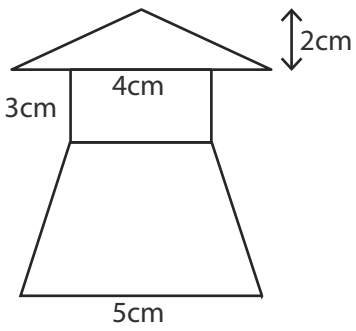
Height of the shape: $15 \div 5 = 3$cm

Height of one triangle: $3 \div 2 = 1.5$cm

Area of one triangle: $0.5 \times 5 \times 1.5 = 3.75$cm^2

Area of both triangles: $2 \times 3.75 = 7.5$cm^2

10. Sammi sketches a rocket out of polygons. The vertical height of the rocket is 10cm and at its widest it is 8cm in length. Calculate the area of the rocket.



Height of the trapezium is $10 - (2 + 3) = 5$cm

The width of the triangle is 8cm.

Area of the trapezium: $0.5 \times (5 + 4) \times 5 = 22.5$cm^2

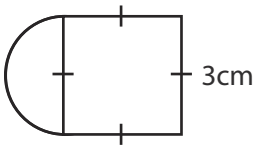
Area of the rectangle: $3 \times 4 = 12$cm^2

Area of the triangle: $0.5 \times 8 \times 2 = 8$cm^2

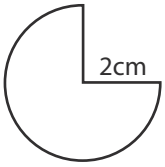
Total area: $22.5 + 12 + 8 = 42.5$cm^2

Compound Shapes with Circles

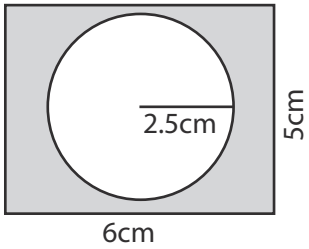
1. Calculate the area of the compound shape, rounding your answer to one decimal place.



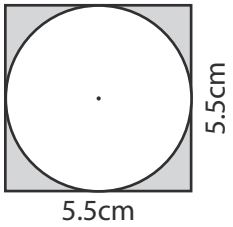
2. Calculate the area of the compound shape, rounding your answer to one decimal place.



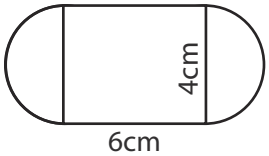
3. Calculate the shaded area, rounding your answer to one decimal place.



4. Calculate the area of the shaded sections, rounding your answer to one decimal place.



5. Calculate the area of the compound shape, rounding your answer to one decimal place.



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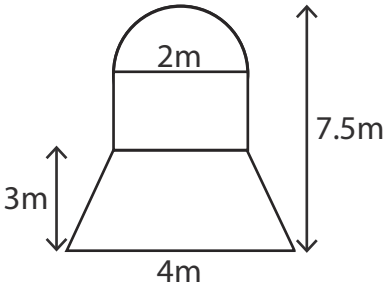
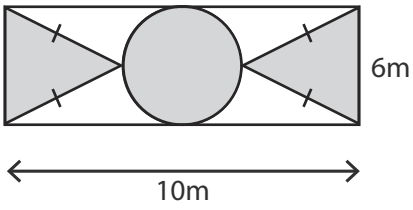


7. Calculate the area of the shaded sections, rounding your answer to one decimal place.



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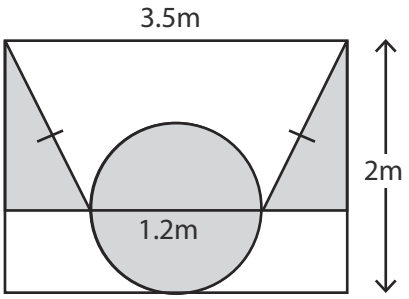
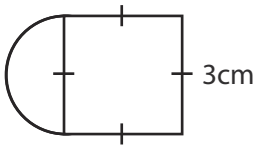


9. Four concentric circles are redrawn as individual circles. The smallest circle has a diameter of 6cm in length. The radius of each circle increases by one centimetre for each circle. Calculate the total area of the four individual circles, leaving your answer in terms of pi.

10. Three congruent circular holes are cut out from a rectangular piece of paper. The paper has a length of ten centimetres and a width of seven centimetres. The circles each have a radius of 2cm and do not overlap. Calculate the area of the remaining shape, leaving your answer in terms of pi.

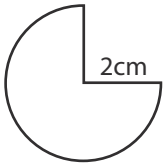
Compound Shapes with Circles Answers

1. Calculate the area of the compound shape, rounding your answer to one decimal place.



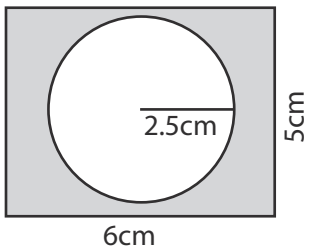
$3^2 + (0.5\pi \times 1.5^2) = 12.5\text{cm}^2$

2. Calculate the area of the compound shape, rounding your answer to one decimal place.



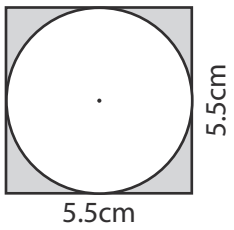
$0.75\pi \times 2^2 = 9.4\text{cm}^2$

3. Calculate the shaded area, rounding your answer to one decimal place.



$(6 \times 5) - (\pi \times 2.5^2) = 10.4\text{cm}^2$

4. Calculate the area of the shaded sections, rounding your answer to one decimal place.

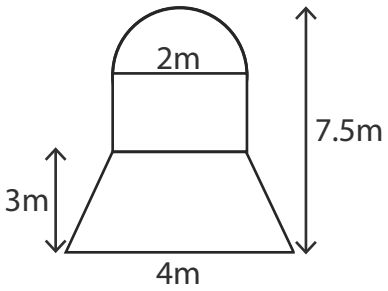


$5.5^2 - (\pi \times 2.75^2) = 6.5\text{cm}^2$

5. Calculate the area of the compound shape, rounding your answer to one decimal place.

$(6 \times 4) + \pi \times 2^2 = 36.6\text{cm}^2$

6. Calculate the area of the compound shape, rounding your answer to one decimal place.



$0.5 \times (2 + 4) \times 3 = 9\text{m}^2$

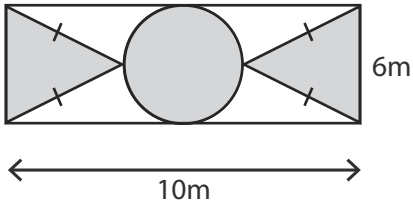
$7.5 - (3 + 1) = 3.5\text{m}$

$3.5 \times 2 = 7\text{m}^2$

$\frac{\pi \times 1^2}{2} = 1.57\ldots\text{m}^2$

$9 + 7 + 1.57\ldots = 17.6\text{m}^2$

7. Calculate the area of the shaded sections, rounding your answer to one decimal place.



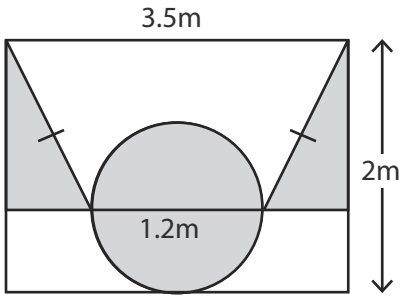
Diameter = 6m

10 – 6 = 4m

Height of each triangle is 4 ÷ 2 = 2m

$2(0.5 \times 2 \times 6) + (\pi \times 3^2) = 40.3\text{m}^2$

8. Calculate the area of the shaded sections, rounding your answer to one decimal place.



3.5 – 1.2 = 2.3m

Base of each triangle is 2.3 ÷ 2 = 1.15m

Height of each triangle is 2 – 0.6 = 1.4m

$2(0.5 \times 1.15 \times 1.4) + (\pi \times 0.6^2) = 2.7\text{cm}^2$

9. Four concentric circles are redrawn as individual circles. The smallest circle has a diameter of 6cm in length. The radius of each circle increases by one centimetre for each circle. Calculate the total area of the four individual circles, leaving your answer in terms of pi.

The radii of the circles are 3, 4, 5 and 6cm.

$(\pi \times 3^2) + (\pi \times 4^2) + (\pi \times 5^2) + (\pi \times 6^2) = 86\pi\text{cm}^2$

10. Three congruent circular holes are cut out from a rectangular piece of paper. The paper has a length of ten centimetres and a width of seven centimetres. The circles each have a radius of 2cm and do not overlap. Calculate the area of the remaining shape, leaving your answer in terms of pi.

$10 \times 7 = 70\text{cm}^2$

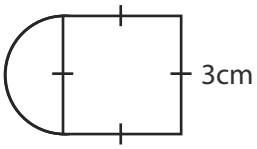
$\pi \times 2^2 = 4\pi\text{cm}^2$

$4\pi \times 3 = 12\pi\text{cm}^2$

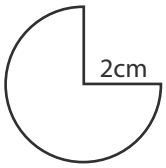
Area = $70 - 12\pi\text{cm}^2$

Compound Shapes with Circles

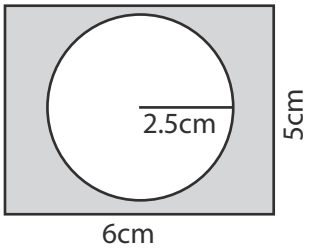
1. Calculate the area of the compound shape, rounding your answer to one decimal place.



2. Calculate the area of the compound shape, rounding your answer to one decimal place.



3. Calculate the shaded area, rounding your answer to one decimal place.



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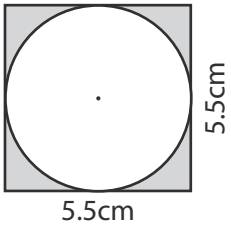

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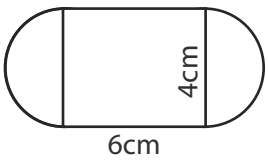

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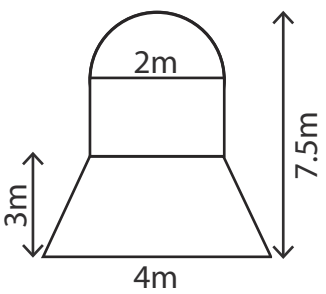

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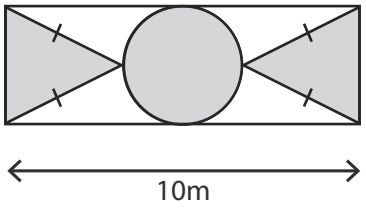

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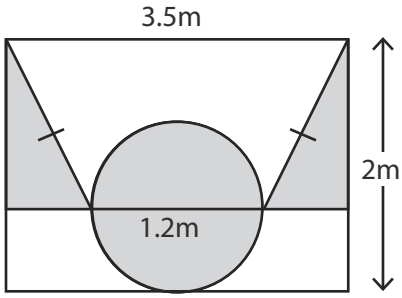

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Compound Shapes with Circles Answers

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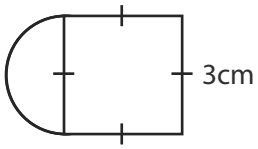

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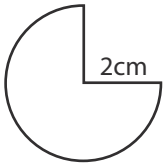
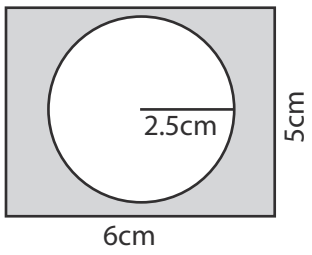


$0.75\pi \times 2^2 = 9.4\text{cm}^2$

3. Calculate the shaded area, rounding your answer to one decimal place.



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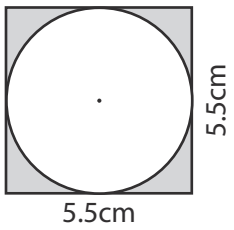
4. Calculate the area of the shaded sections, rounding your answer to one decimal place.



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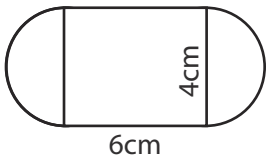

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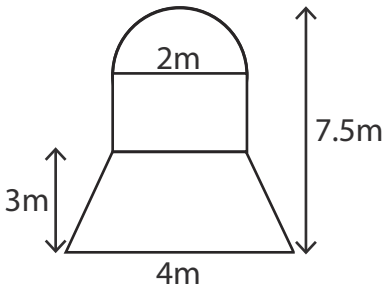

$0.5 \times (2 + 4) \times 3 = 9\text{m}^2$

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$9 + 7 + 1.57\ldots = 17.6\text{m}^2$

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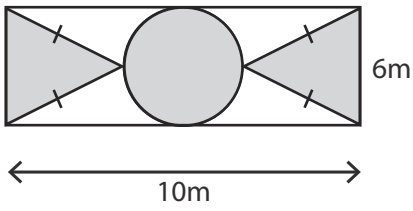

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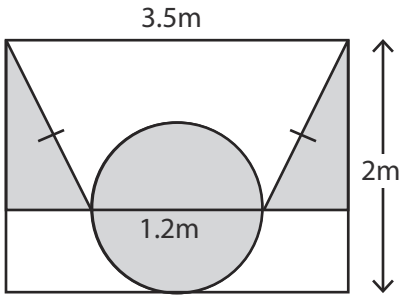

3.5 – 1.2 = 2.3m

Base of each triangle is 2.3 ÷ 2 = 1.15m

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$10 \times 7 = 70\text{cm}^2$

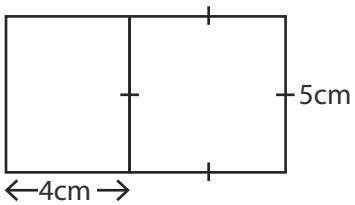
$\pi \times 2^2 = 4\pi\text{cm}^2$

$4\pi \times 3 = 12\pi\text{cm}^2$

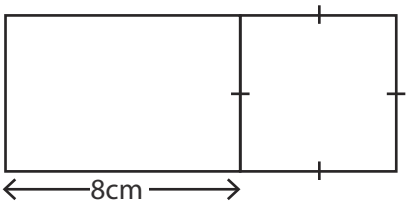
Area = $70 - 12\pi\text{cm}^2$

Compound Shapes

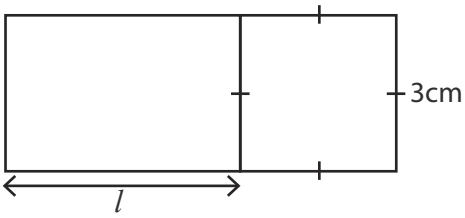
1. The diagram shows a compound shape made up of a rectangle and square. Calculate its area.



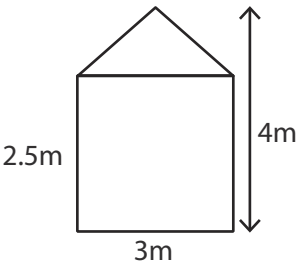
2. The diagram shows a compound shape made up of a rectangle and square. The area of the square is 16cm^2. Calculate the area of the compound shape.



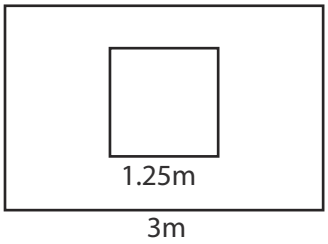
3. The diagram shows a compound shape made up of a rectangle and square. The area of the compound shape is 22.5cm^2. Calculate the value of the length l.



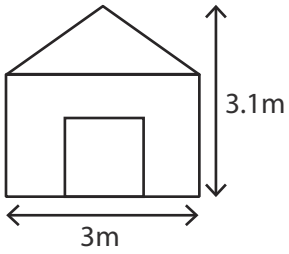
4. The diagram shows a compound shape made up of a rectangle and triangle Calculate the area of the compound shape.



5. A square hole is cut out of a grass lawn in order to plant vegetable seeds. Calculate the area of the lawn that is left over.

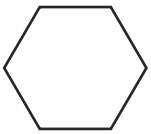


6. The front view of a shed is shown. The rectangular cross-section, including the door, has a total area of 3.6m^2. Calculate the vertical height of the triangular roof.

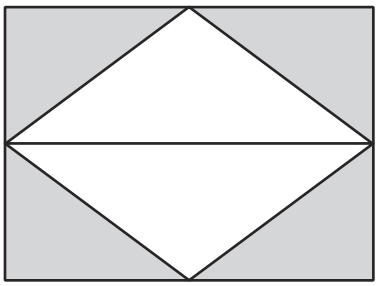


7. Calculate the area of the cross-section of the triangular roof in question 6.

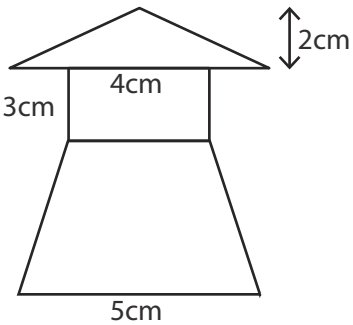
8. A regular hexagon with an area of 32cm^2 is tessellated to form a pattern. How many hexagons are in the pattern if the total area is 480cm^2?



9. A shape is made up of two congruent triangles inscribed in a rectangle. The shape has a total area of 15cm^2 and a horizontal length of 5cm. Calculate the total area of the two triangles.

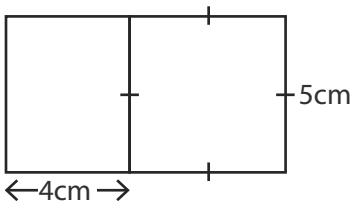


10. Sammi sketches a rocket out of polygons. The vertical height of the rocket is 10cm and at its widest it is 8cm in length. Calculate the area of the rocket.



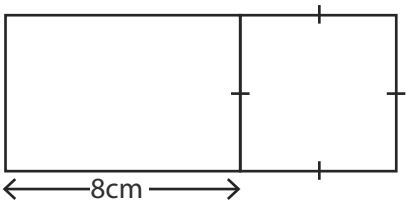
Compound Shapes Answers

1. The diagram shows a compound shape made up of a rectangle and square. Calculate its area.



$(4 \times 5) + (5 \times 5) = 45\text{cm}^2$

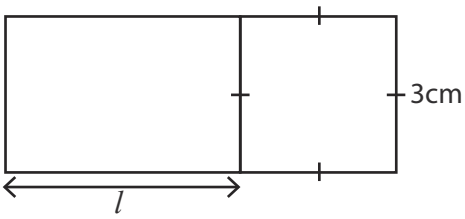
2. The diagram shows a compound shape made up of a rectangle and square. The area of the square is 16cm^2. Calculate the area of the compound shape.



$\sqrt{16} = 4\text{cm}$

$(8 \times 4) + 16 = 48\text{cm}^2$

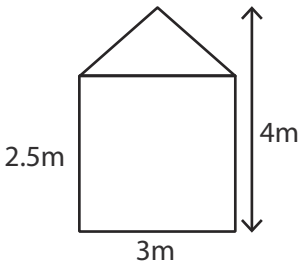
3. The diagram shows a compound shape made up of a rectangle and square. The area of the compound shape is 22.5cm^2. Calculate the value of the length l.



$22.5 - 3^2 = 13.5\text{cm}^2$

$13.5 \div 3 = 4.5\text{cm}$

4. The diagram shows a compound shape made up of a rectangle and triangle Calculate the area of the compound shape.



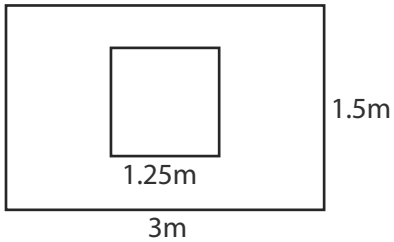
$2.5 \times 3 = 7.5\text{m}^2$

$4 - 2.5 = 1.5\text{m}$

$0.5 \times 3 \times 1.5 = 2.25\text{m}^2$

$7.5 + 2.25 = 9.75\text{m}^2$

5. A square hole is cut out of a grass lawn in order to plant vegetable seeds. Calculate the area of the lawn that is left over.

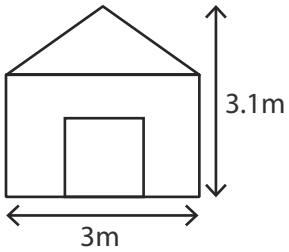


$3 \times 1.5 = 4.5\text{m}^2$

$1.25^2 = 1.5625\text{m}^2$

$4.5 - 1.5625 = 2.94\text{m}^2$ (2d.p.)

6. The front view of a shed is shown. The rectangular cross-section, including the door, has a total area of 3.6m^2. Calculate the vertical height of the triangular roof.



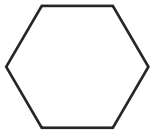
$3.6 \div 3 = 1.2$m

$3.1 - 1.2 = 1.9$m

7. Calculate the area of the cross-section of the triangular roof in question 6.

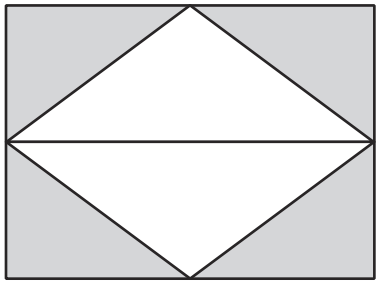
$0.5 \times 1.9 \times 3 = 2.85$m

8. A regular hexagon with an area of 32cm^2 is tessellated to form a pattern. How many hexagons are in the pattern if the total area is 480cm^2?



$480 \div 32 = 15$ hexagons

9. A shape is made up of two congruent triangles inscribed in a rectangle. The shape has a total area of 15cm^2 and a horizontal length of 5cm. Calculate the total area of the two triangles.



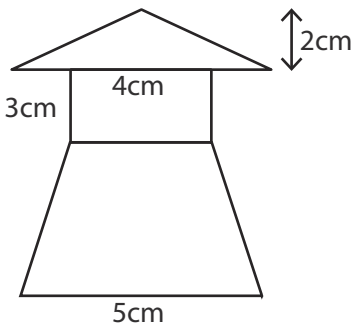
Height of the shape: $15 \div 5 = 3$cm

Height of one triangle: $3 \div 2 = 1.5$cm

Area of one triangle: $0.5 \times 5 \times 1.5 = 3.75$cm^2

Area of both triangles: $2 \times 3.75 = 7.5$cm^2

10. Sammi sketches a rocket out of polygons. The vertical height of the rocket is 10cm and at its widest it is 8cm in length. Calculate the area of the rocket.



Height of the trapezium is $10 - (2 + 3) = 5$cm

The width of the triangle is 8cm.

Area of the trapezium: $0.5 \times (5 + 4) \times 5 = 22.5$cm^2

Area of the rectangle: $3 \times 4 = 12$cm^2

Area of the triangle: $0.5 \times 8 \times 2 = 8$cm^2

Total area: $22.5 + 12 + 8 = 42.5$cm^2