

High School Mathematics Test 2015

Year 8

Area of Plane Shapes

Non Calculator
Section

Skills and Knowledge Assessed:

- Find ~~perimeters and~~ areas of parallelograms, trapeziums, rhombuses and kites (ACMMG196)
- Investigate the relationship between features of circles such as ~~circumference~~, area, radius and diameter. Use formulas to solve problems involving ~~circumference and~~ area (ACMMG197)
- Choose appropriate units of measurement for area ~~and volume~~ and convert from one unit to another (ACMMG195)
- Establish the formulas for areas of rectangles, triangles and parallelograms and use these in problem solving (ACMMG159)

Name _____

Answer all questions in the spaces provided on this test paper by:

Writing the answer in the box provided.

or

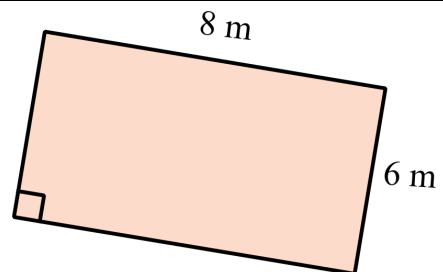
Shading in the bubble for the correct answer from the four choices provided.

Show any working out on the test paper. Calculators are **not** allowed.

1. A square field has an area of 36 m^2 .
What is the length of the sides of the field?

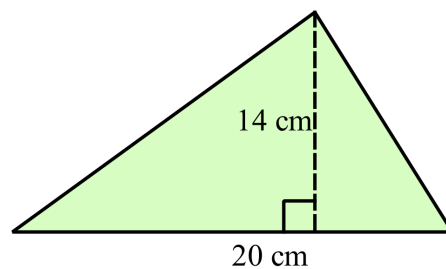
2. What is the area of this rectangle?

- ☐ 28 m^2
☐ 36 m^2
☐ 48 m^2
☐ 64 m^2



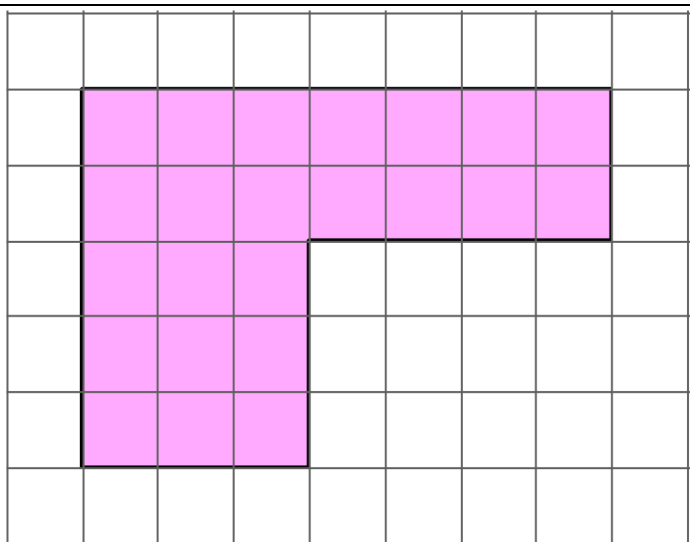
3. Find the area of this triangle.

- ☐ 70 m^2
☐ 140 m^2
☐ 210 m^2
☐ 280 m^2



4.

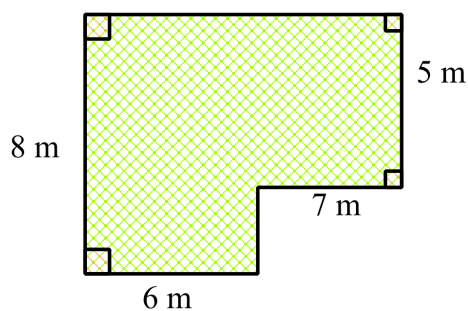
The shaded shape is drawn on 1 cm grid.
What is the area of the shape?



5.

What is the area of this shape?

- ☐ 26 m²
- ☐ 53 m²
- ☐ 82 m²
- ☐ 83 m²



6.

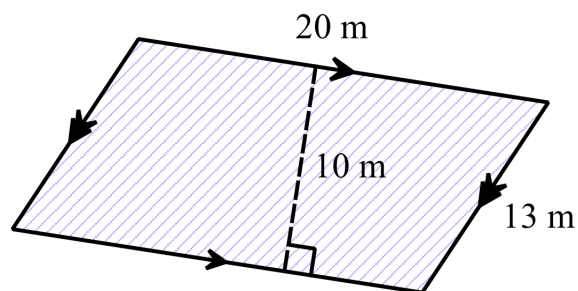
How many square millimetres are there in a square metre?

- ☐ 1 000
- ☐ 10 000
- ☐ 100 000
- ☐ 1 000 000

7.

What is the area of the parallelogram shown?

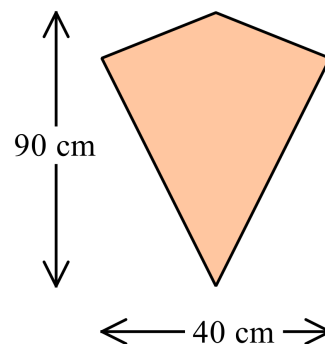
- ☐ 100 m²
- ☐ 130 m²
- ☐ 200 m²
- ☐ 260 m²



8.

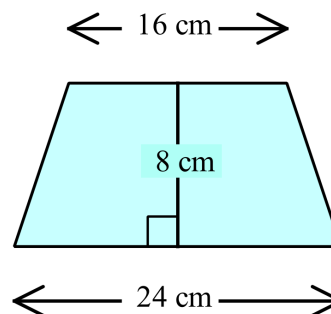
What is the area of this kite?

- ☐ 1 800 cm²
- ☐ 2 400 cm²
- ☐ 3 600 cm²
- ☐ 7 200 cm²



9.

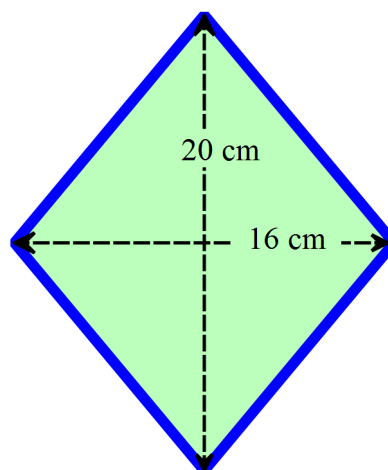
What is the area of the trapezium?



10.

A photo frame is in the shape of a rhombus.

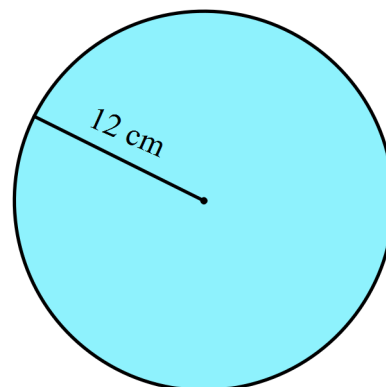
What is its area?



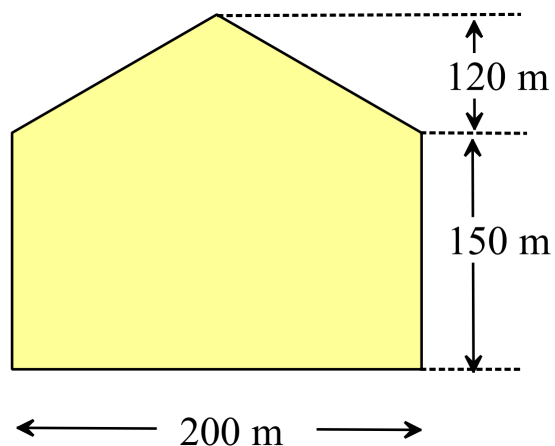
11.

What is the area of a circle with radius 12 cm?

- ☐ 24π cm²
- ☐ 36π cm²
- ☐ 72π cm²
- ☐ 144π cm²

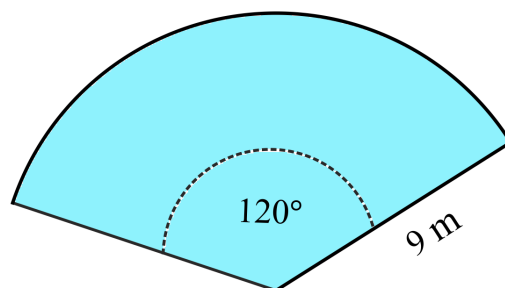


12. Find the area of the plot of land which is shaded (to the nearest tenth of a hectare).
(1 ha = 10 000 m²)



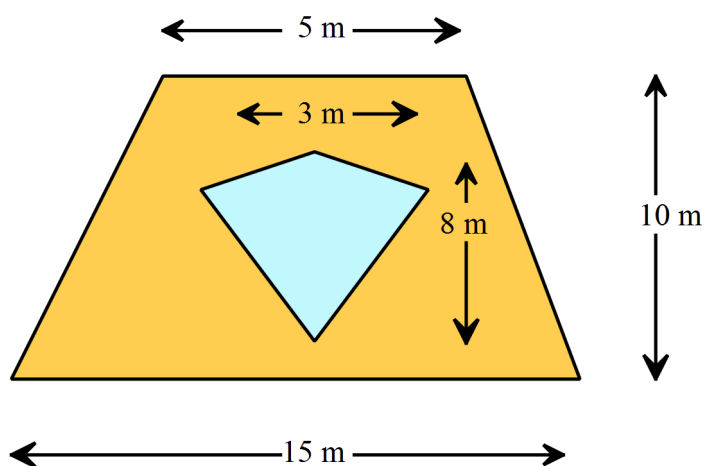
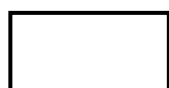
13. What is the area of this sector of a circle?

- ☐ $18\pi \text{ m}^2$
☐ $27\pi \text{ m}^2$
☐ $54\pi \text{ m}^2$
☐ $81\pi \text{ m}^2$



14. A trapezoidal wall, has a banner in the shape of a kite hanging on it as shown.

What area of the wall is visible?

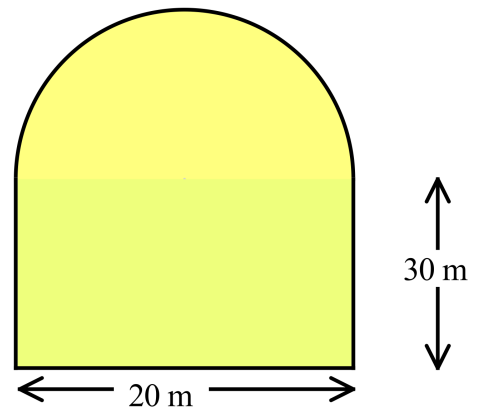


15.

The rear wall of a storage shed is in the shape shown.

What is the area of the wall (in terms of π)?

- ☐ $600 + 50\pi \text{ m}^2$
- ☐ $600 + 100\pi \text{ m}^2$
- ☐ $900 + 50\pi \text{ m}^2$
- ☐ $900 + 100\pi \text{ m}^2$



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Short Answer
Section

Name _____

Answer all questions in the spaces provided on this test paper by:

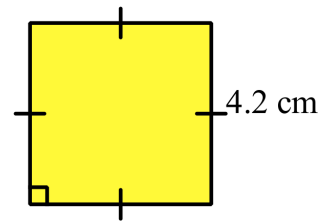
Writing the answer in the box provided.

or

Shading in the bubble for the correct answer from the four choices provided.

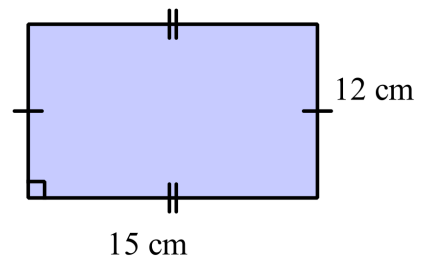
Show any working out on this test paper. Calculators are allowed.

1. What is the area of the square shown?

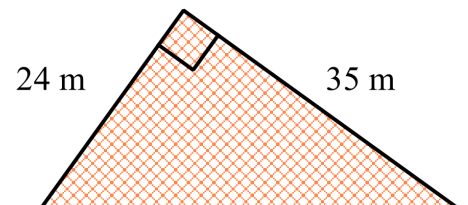
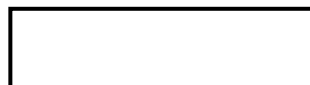


2. Find the area of this rectangle.

- ☐ 54 cm^2
☐ 90 cm^2
☐ 120 cm^2
☐ 180 cm^2



3. What is the area of the triangle?

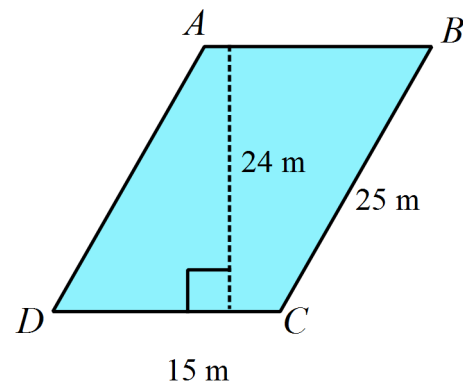


4.

 $ABCD$ is a parallelogram.

What is its area in square metres?

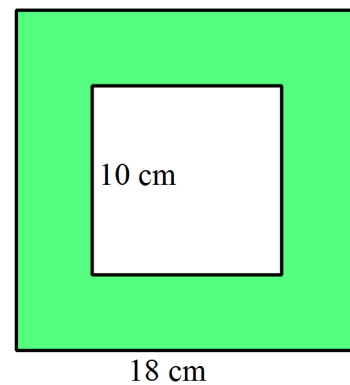
- ☐ 128 m^2
☐ 300 m^2
☐ 360 m^2
☐ 375 m^2



5.

What is the area of the shaded section between the two squares?

- ☐ 100 cm^2
☐ 224 cm^2
☐ 324 cm^2
☐ 424 cm^2

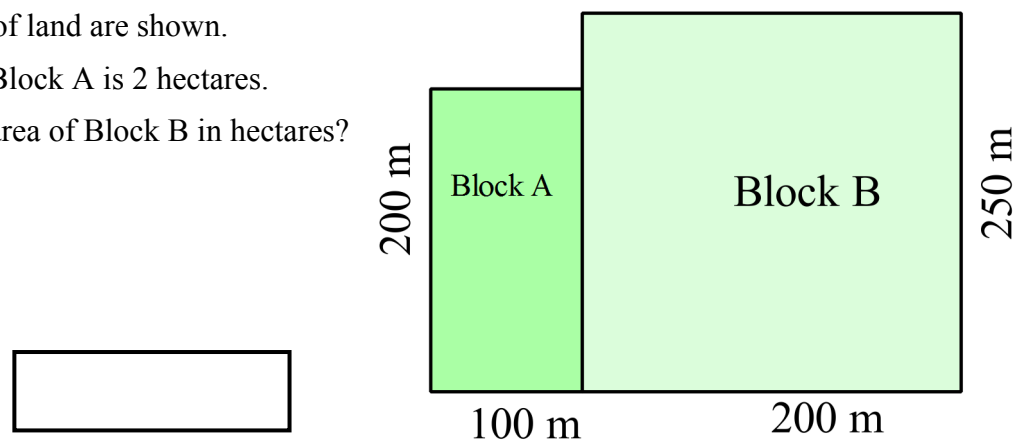


6.

Two blocks of land are shown.

The area of Block A is 2 hectares.

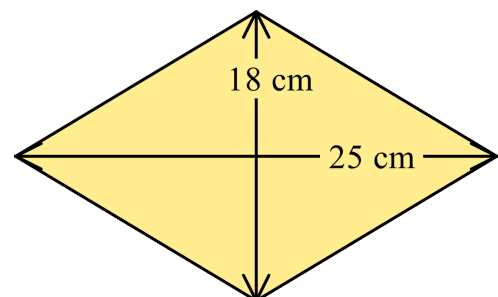
What is the area of Block B in hectares?



7.

What is the area of this rhombus?

- ☐ 225 cm^2
☐ 325 cm^2
☐ 430 cm^2
☐ 450 cm^2

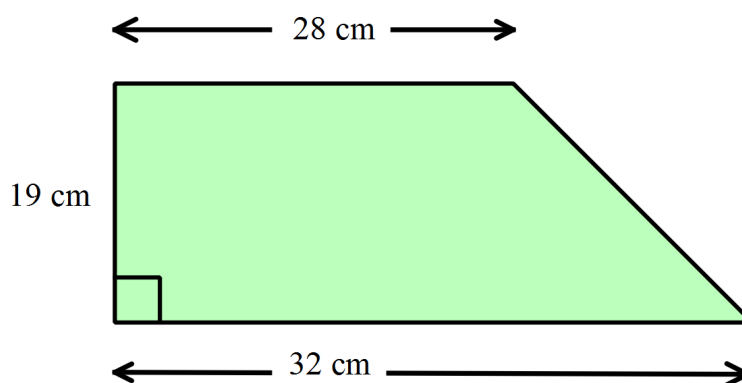


8.

A trapezium has the dimensions shown.

What is its area?

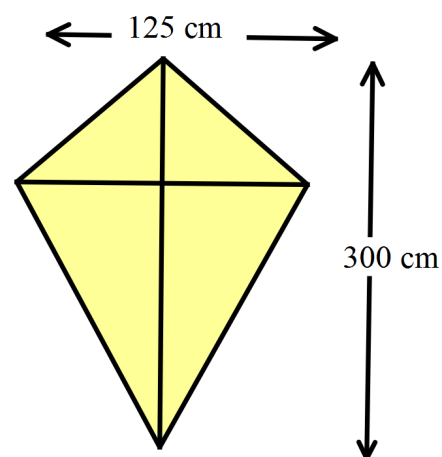
- ☐ 266 cm²
☐ 304 cm²
☐ 570 cm²
☐ 1 140 cm²



9.

A window in a building is in the shape of a kite with the dimensions shown.

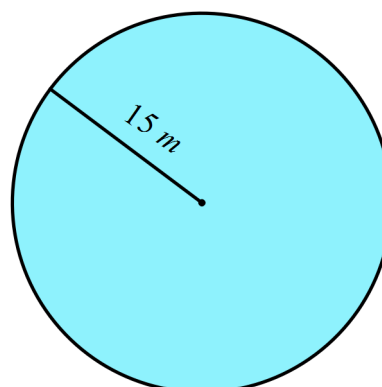
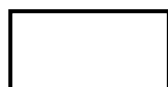
What is the area of the window?



10.

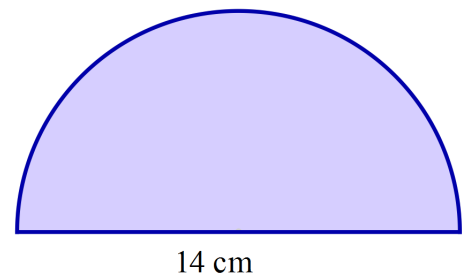
What is the area of the circle shown?

Answer to the nearest cm².



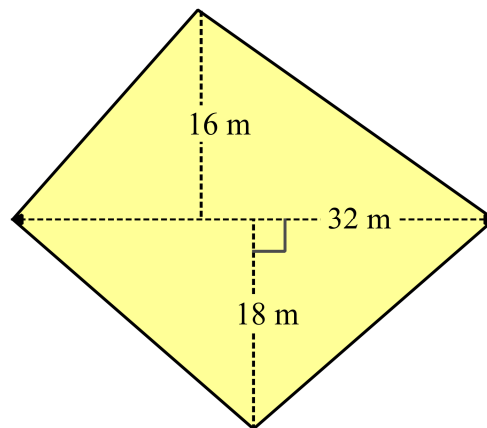
11. Find the area of this semicircle, correct to 1 decimal place.

- ☐ 77.0 cm²
☐ 88.0 cm²
☐ 153.9 cm²
☐ 307.9 cm²

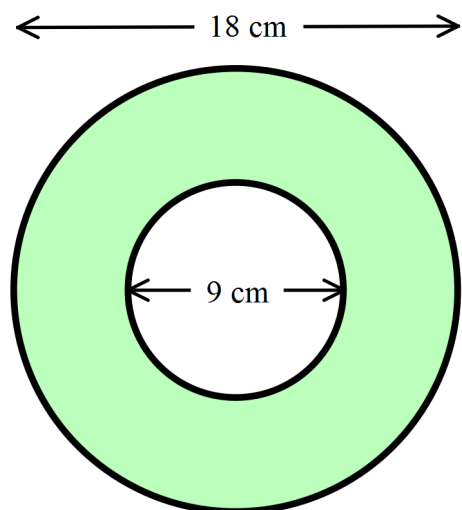


12. What is the area of the quadrilateral?

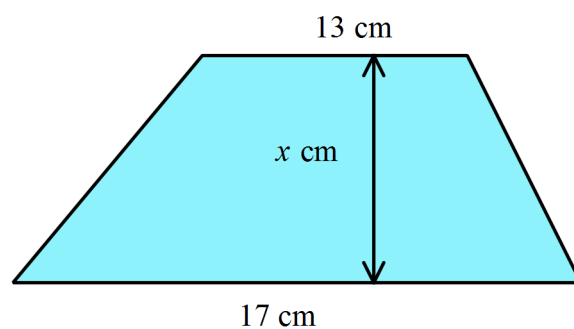
- ☐ 272 m²
☐ 544 m²
☐ 823 m²
☐ 1 088 m²



13. What is the area between the two circles?
Answer to the nearest square centimetre.

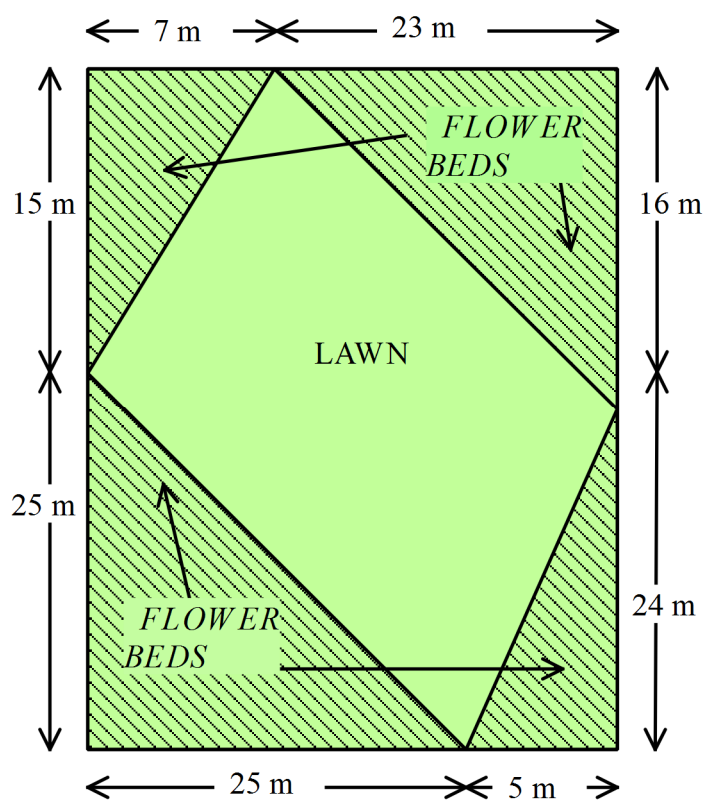


14. The trapezium shown has an area of 450 cm^2 .
The perpendicular height is $x \text{ cm}$.
What is the value of x ?



15. A rectangular garden which measures 30 m by 40 m has flower beds which surround a lawn which is an irregular quadrilateral.

What is the area of the lawn?



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ANSWERS

No.	WORKING	ANSWER
1.	$(\text{length})^2 = 36$ $\text{length} = 6$	6 m
2.	$\text{Area} = 8 \times 6 = 48 \text{ m}^2$	3 rd answer
3.	$\text{Area} = \frac{1}{2} \times 20 \times 14 = 10 \times 14 = 140 \text{ m}^2$	2 nd answer
4.	$2 \text{ rows of } 7 \text{ and } 3 \text{ rows of } 3 = 14 + 9 = 23 \text{ cm}^2$	23 cm ²
5.	$\begin{aligned} \text{Area} &= 6 \times 8 + 5 \times 7 \\ &= 48 + 35 \\ &= 83 \text{ m}^2 \end{aligned}$	4 th answer
6.	$\begin{aligned} 1 \text{ m}^2 &= 1000\text{mm} \times 1000 \text{ mm} \\ &= 1\,000\,000 \text{ mm}^2 \end{aligned}$	4 th answer
7.	$A = bh = 10 \times 20 = 200 \text{ m}^2$	3 rd answer
8.	$\begin{aligned} A &= \frac{1}{2}xy = \frac{1}{2} \times 90 \times 40 \\ &= 90 \times 20 \\ &= 1800 \text{ cm}^2 \end{aligned}$	1 st answer
9.	$\begin{aligned} A &= \frac{h}{2}(a + b) = \frac{8}{2} \times (16 + 24) \\ &= 4 \times 40 \\ &= 160 \text{ cm}^2 \end{aligned}$	160 cm ²

10.	$A = \frac{1}{2}xy = \frac{1}{2} \times 20 \times 16$ $= 10 \times 16$ $= 160 \text{ cm}^2$	160 cm ²
11.	$A = \pi \times 12^2$ $= 144 \pi \text{ cm}^2$	4 th Answer
12.	$A = \frac{1}{2} \times 200 \times 120 + 200 \times 150$ $= 12000 + 30000$ $= 42000 \text{ m}^2$ $= 4.2 \text{ Ha}$	4.2 Ha
13.	$A = \frac{1}{3} \times \pi \times 9^2$ $= 27 \pi \text{ cm}^2$	2 nd answer
14.	$A = \frac{10}{2}(5 + 15) - \frac{1}{2} \times 3 \times 8 = 5 \times (20) - 3 \times 4$ $= 100 - 12$ $= 88 \text{ cm}^2$	88 cm ²
15.	$\text{Area} = 20 \times 30 + \frac{1}{2} \times \pi \times 10^2$ $= 600 + 50\pi \text{ m}^2$	1 st answer

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ANSWERS

No.	WORKING	ANSWER
1.	$\text{Area} = 4.2^2 = 17.64 \text{ cm}^2$	17.64 cm^2
2.	$\text{Area} = 12 \times 15 = 180 \text{ cm}^2$	4 th answer
3.	$\text{Area} = \frac{1}{2} \times 24 \times 35 = 420 \text{ m}^2$	420 m^2
4.	$\text{Area} = bh = 15 \times 24 = 360 \text{ m}^2$	3 rd Answer
5.	$\text{Area} = 18^2 - 10^2$ $= 324 - 100$ $= 224 \text{ cm}^2$	2 nd answer
6.	$\text{Area Block A} = 200 \times 100 = 20\,000 \text{ m}^2 = 2 \text{ hA}$ so 1 hectare = $10\,000 \text{ m}^2$ $\text{Area Block B} = 200 \times 250 = 50\,000 \text{ m}^2$ $= 5 \text{ hA}$	5 hectares
7.	$\text{Area} = \frac{1}{2}xy = \frac{1}{2} \times 18 \times 25$ $= 225 \text{ cm}^2$	1 st answer

8.	$\begin{aligned}\text{Area} &= \frac{h}{2}(a + b) \\ &= \frac{19}{2}(28 + 32) \\ &= \frac{19}{2} \times 60 \\ &= 570 \text{ cm}^2\end{aligned}$	3 rd answer
9.	$\begin{aligned}\text{Area} &= \frac{1}{2}xy \\ &= \frac{1}{2} \times 125 \times 300 \\ &= 18\,750 \text{ cm}^2\end{aligned}$	$18\,750 \text{ cm}^2$ Or 1.875 m^2
10.	$\begin{aligned}\text{Area} &= \pi \times 15^2 \\ &= 706.8583 \\ &= 707 \text{ cm}^2 \text{ (nearest cm}^2\text{)}\end{aligned}$	707 cm^2
11.	$\begin{aligned}\text{Area} &= \frac{\pi \times 7^2}{2} \\ &= 76.9690 \\ &= 77.0 \text{ cm}^2 \text{ (one decimal place)}\end{aligned}$	1 st answer
12.	$\begin{aligned}\text{Area} &= \frac{1}{2} \times 32 \times 16 + \frac{1}{2} \times 32 \times 18 \\ &= 256 + 288 \\ &= 544 \text{ m}^2\end{aligned}$	2 nd answer
13.	$\begin{aligned}\text{Area} &= \pi \times 9^2 - \pi \times 4.5^2 \\ &= 254.469 - 63.617 \\ &= 190.852 \\ &= 191 \text{ cm}^2 \text{ (nearest cm}^2\text{)}\end{aligned}$	191 cm^2
14.	$\begin{aligned}\text{Area} &= \frac{h}{2}(a + b) \\ \frac{x}{2}(13 + 17) &= 450 \text{ cm}^2 \\ \frac{x}{2} \times 30 &= 450 \\ \frac{x}{2} &= \frac{450}{30} = 15 \\ x &= 15 \times 2 = 30\end{aligned}$	$x = 30$

15.	$\begin{aligned}\text{Area of flower beds} &= \frac{1}{2} \times 15 \times 7 + \frac{1}{2} \times 23 \times 16 \\ &+ \frac{1}{2} \times 25 \times 25 + \frac{1}{2} \times 5 \times 24 \\ &= 52.5 + 184 + 312.5 + 60 \\ &= 609 \text{ m}^2 \\ \text{Area of lawn} &= 40 \times 30 - 609 \\ &= 1200 - 609 \\ &= 591 \text{ m}^2\end{aligned}$	591 m ²
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