High School Mathematics Test 2015

Year 9 **Area of Plane Shapes** Non Calculator

Skills and Knowledge Assessed:

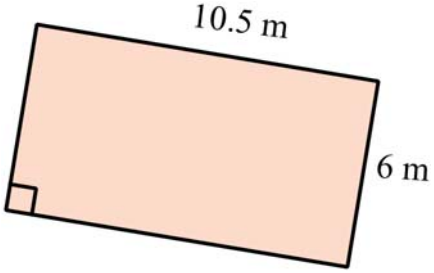
- Find perimeters and areas of parallelograms, trapeziums, rhombuses and kites (ACMMG196)
- Investigate the relationship between features of circles such as ~~circumference,~~ area, radius and diameter. Use formulas to solve problems involving ~~circumference and~~ area (ACMMG197)
- Choose appropriate units of measurement for area ~~and volume~~ and convert from one unit to another (ACMMG195)
- Calculate the areas of composite shapes (ACMMG216)

Name_____

Section 1 Short Answer Section

Write all working and answers in the spaces provided on this test paper.

1. What is the area of this rectangle?



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2. A square field has an area of 25 m^2.
What is the length of the sides of the field?

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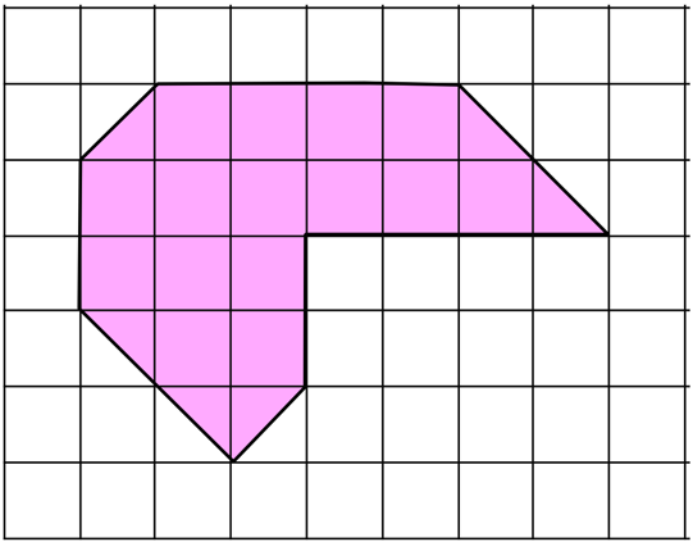
3. The shaded shape is drawn on 1 cm grid.
What is the area of the shape?



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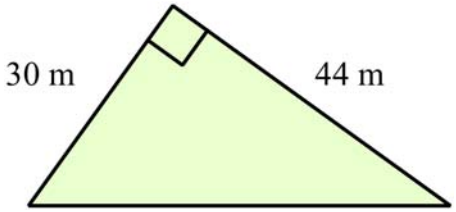
4. What is the area of the triangle?



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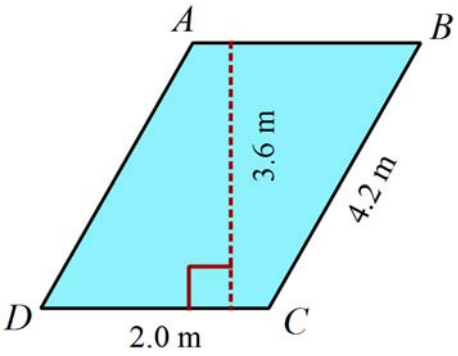
5. *ABCD* is a parallelogram.
What is its area in square metres?



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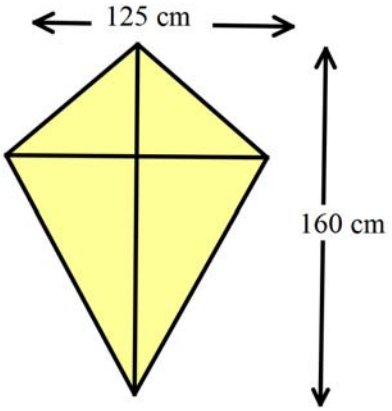
6. A window in a building is in the shape of a kite with the dimensions shown.
What is the area of the window?



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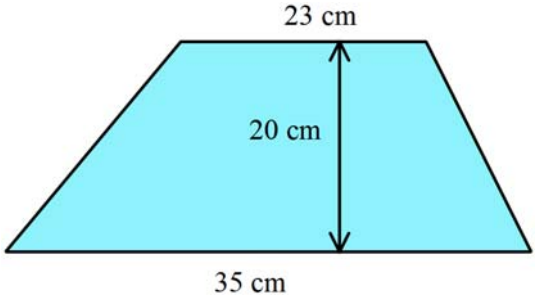
7. What is the area of the trapezium shown?



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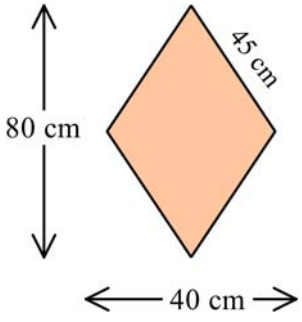
8. What is the area of this rhombus?



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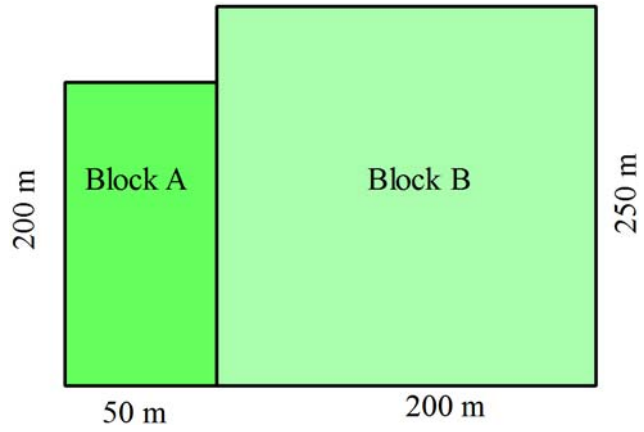
9. Two blocks of land are shown.

The area of Block A is 1 hectare.

What is the area of Block B in hectares?



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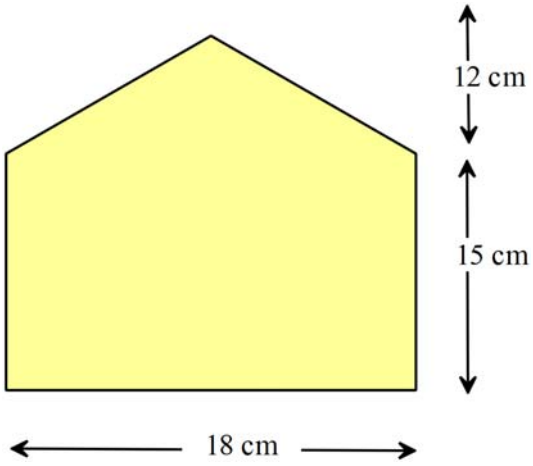
10. Find the area of the pentagon shown.



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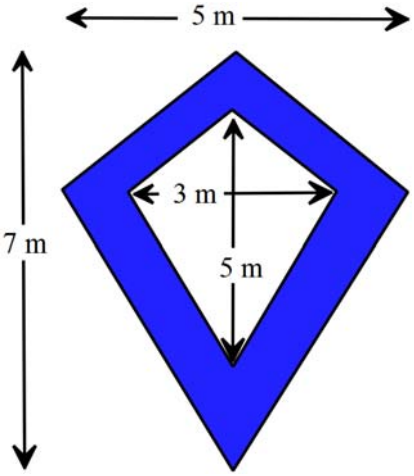
11. A silk banner is in the shape of a blue kite with a smaller inner white kite.

What is the area of blue silk?



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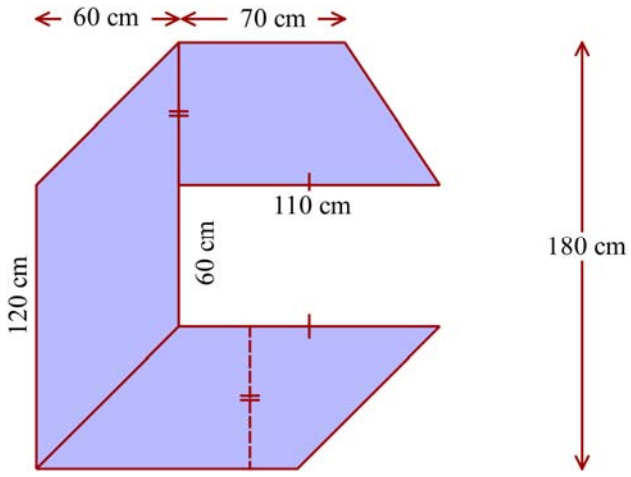
12. The logo for a company is made up of two parallelograms and a trapezium, as shown.

The logo is to be made from sheet metal.

What area of metal would be needed?



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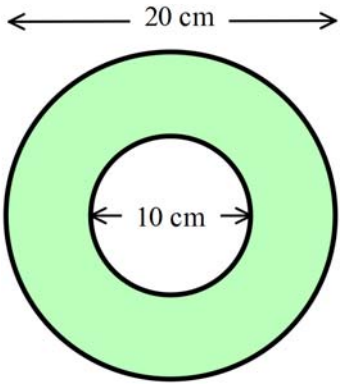
13. What is the area between the two circles?

Answer in terms of π.



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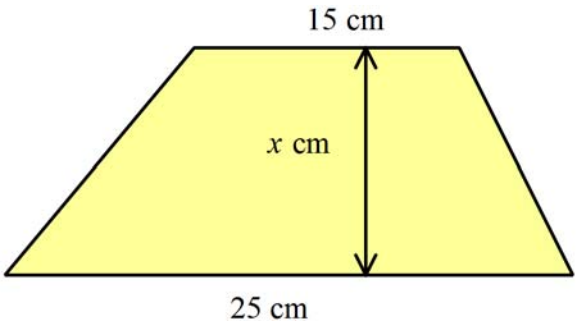
14. The trapezium shown has an area of 480 cm^2.

The perpendicular height is x cm.

What is the value of x?



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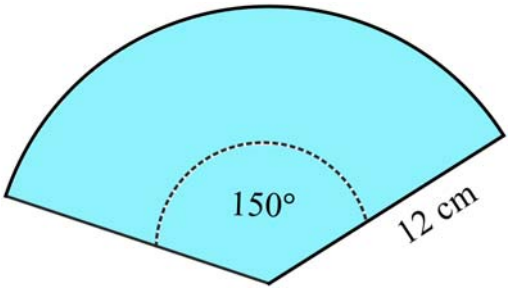
15. What is the area of this sector of a circle?

Answer in terms of π.



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High School
Mathematics Test 2015

Year 9 **Area of Plane Shapes**

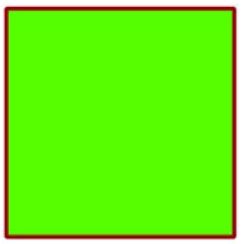
Calculator Allowed

Name_____

Section 2 Multiple Choice Section

Mark all your answers on the accompanying multiple choice answer sheet, not on this test paper. You may do any working out on this test paper. Calculators are allowed for this section.

1. What is the area of this square?

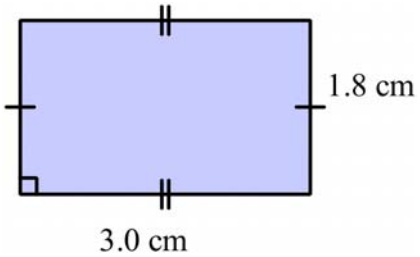


A. 2.25 cm^2
B. 2.5 cm^2
C. 3.0 cm^2
D. 6.25 cm^2

2. How many square centimetres are there in 0.5 square metres?

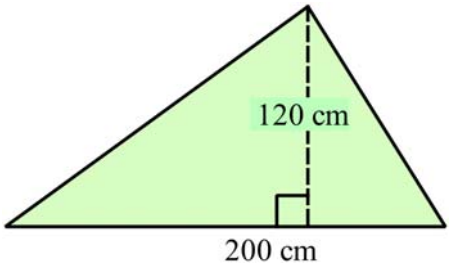
A. 50 B. 500 C. 5 000 D. 50 000

3. Find the area of this rectangle.



A. 4.8 cm^2
B. 5.4 cm^2
C. 9.6 cm^2
D. 10.8 cm^2

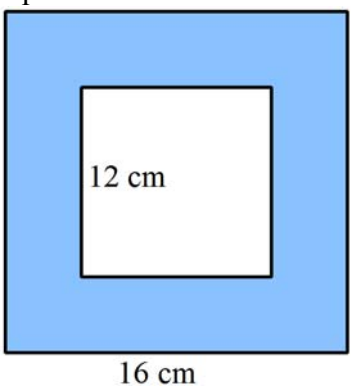
4. Find the area of this triangle.



A. 320 cm^2
B. 6 000 cm^2
C. 12 000 cm^2
D. 24 000 cm^2

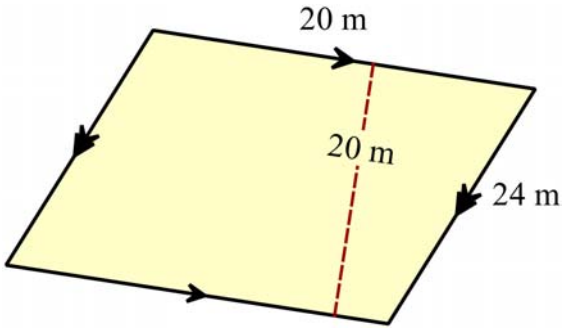
5. What is the area of the shaded section between the two squares?

A. 16 cm^2
B. 112 cm^2
C. 144 cm^2
D. 256 cm^2



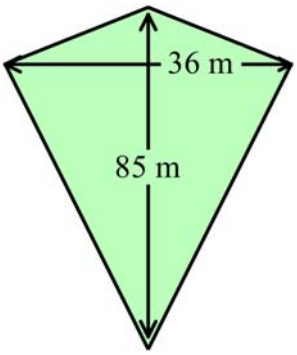
6. What is the area of the parallelogram shown?

A. 200 m^2
B. 240 m^2
C. 400 m^2
D. 480 m^2



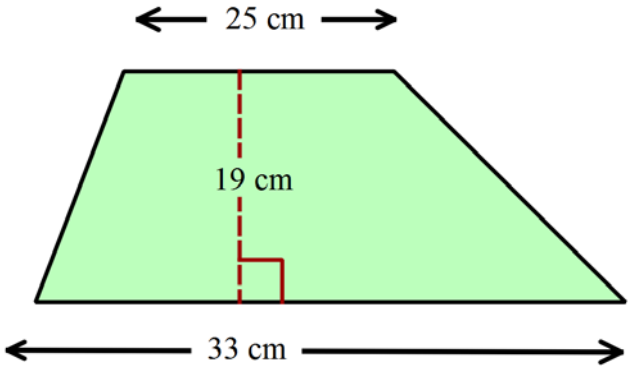
7. What is the area of this kite?

A. 1 530 cm^2
B. 2 420 cm^2
C. 3 060 cm^2
D. 6 120 cm^2

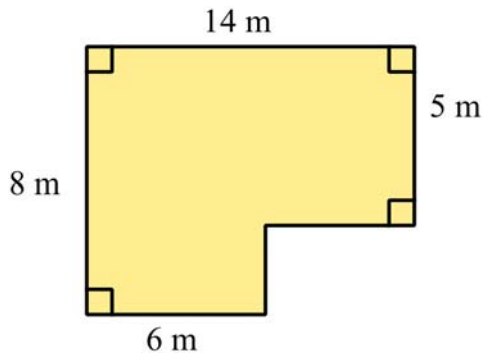


8. A trapezium has the dimensions shown.
What is its area?

A. 237.5 cm^2
B. 275.5 cm^2
C. 313.5 cm^2
D. 551 cm^2

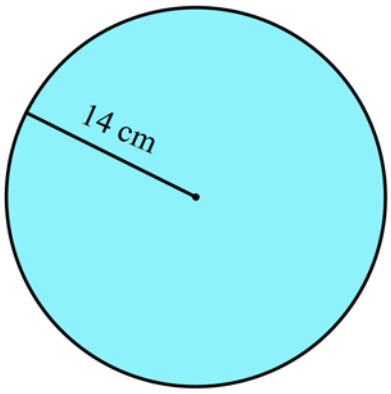


9. What is the area of this shape?



A. 82 m^2
B. 88 m^2
C. 118 m^2
D. 142 m^2

10. What is the area of a circle with radius 14 cm?

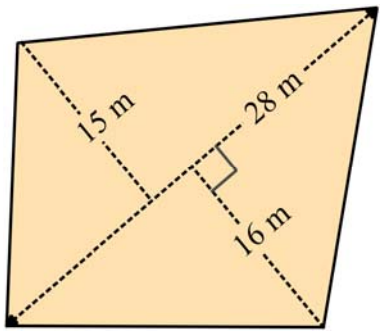


A. 44.0 cm^2
B. 88.0 cm^2
C. 153.9 cm^2
D. 615.8 cm^2

11. A circle has an area of 113 m^2.
What is its radius (to the nearest half metre)?

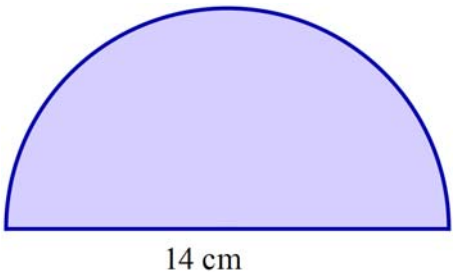
A. 4.5 cm B. 5.0 cm C. 5.5 cm D. 6.0 cm

12. What is the area of the quadrilateral?



A. 434 m^2
B. 644 m^2
C. 658 m^2
D. 868 m^2

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

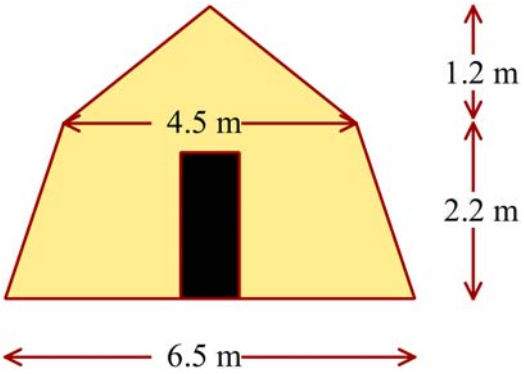


A. 77.0 cm^2
B. 88.0 cm^2
C. 153.9 cm^2
D. 307.9 cm^2

14. A canvas tent has a front with the dimensions shown.

The door is made from insect mesh and measures 0.8 m by 2.0 m.

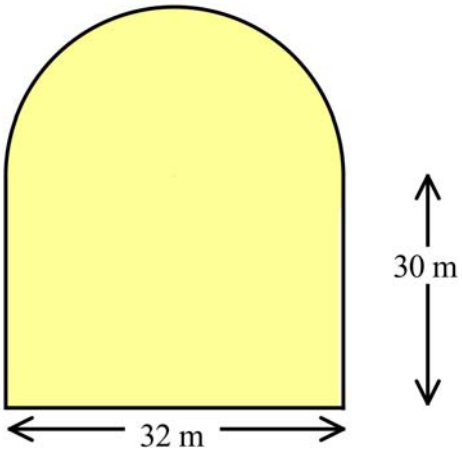
What area of canvas is needed for the front of the tent?



A. 6.3 m^2
B. 13.2 m^2
C. 15.5 m^2
D. 15.9 m^2

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

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



A. $480 + 128\pi$ m^2
B. $480 + 256\pi$ m^2
C. $960 + 128\pi$ m^2
D. $960 + 256\pi$ m^2

High School
Mathematics Test 2015

Multiple Choice Answer Sheet

Area of Plane Shapes

Name _____

Completely fill the response oval representing the most correct answer.

1.	A ⬭	B ⬭	C ⬭	D ⬭
2.	A ⬭	B ⬭	C ⬭	D ⬭
3.	A ⬭	B ⬭	C ⬭	D ⬭
4.	A ⬭	B ⬭	C ⬭	D ⬭
5.	A ⬭	B ⬭	C ⬭	D ⬭
6.	A ⬭	B ⬭	C ⬭	D ⬭
7.	A ⬭	B ⬭	C ⬭	D ⬭
8.	A ⬭	B ⬭	C ⬭	D ⬭
9.	A ⬭	B ⬭	C ⬭	D ⬭
10.	A ⬭	B ⬭	C ⬭	D ⬭
11.	A ⬭	B ⬭	C ⬭	D ⬭
12.	A ⬭	B ⬭	C ⬭	D ⬭
13.	A ⬭	B ⬭	C ⬭	D ⬭
14.	A ⬭	B ⬭	C ⬭	D ⬭
15.	A ⬭	B ⬭	C ⬭	D ⬭

Year 9 *Area of Plane Shapes* Non Calculator

Section 1 Short Answer Section

ANSWERS

No.	WORKING	ANSWER
1.	$\text{Area} = 6 \times 10.5$ $= 63.0 \text{ m}^2$	63.0 m²
2.	$\text{Area} = 25 \text{ m}^2$ $s^2 = 25 \text{ m}^2$ $s = \sqrt{25} = 5 \text{ m}$	5 m
3.	15 whole squares and 6 half squares. = 15 + 3 squares. = 18 cm²	18 cm²
4.	$\text{Area} = \frac{1}{2} \times 30 \times 44$ $= 30 \times 22$ $= 660 \text{ m}^2$	660 m²
5.	$\text{Area} = 2.0 \times 3.6$ $= 7.2 \text{ m}^2$	7.2 m²
6.	$\text{Area} = \frac{1}{2} \times 125 \times 160$ $= 10\,000 \text{ cm}^2$	10 000 cm²
7.	$\text{Area} = \frac{20}{2} \times (23 + 35)$ $= 10 \times 58$ $= 580 \text{ cm}^2$	580 cm²
8.	$\text{Area} = \frac{1}{2} \times 80 \times 40$ $= 1\,600 \text{ cm}^2$	1 600 cm²
9.	Area A $= 50 \times 200 = 10\,000 \, m^2 = 1$ ha $B = 200 \times 250 = 50\,000$ $= 5 \times 10\,000 = 5$ ha	5 hectares

10.	$\text{Area} = 18 \times 15 + \frac{1}{2} \times 18 \times 12$ $= 9 \times 30 + 9 \times 12$ $= 270 + 108$ $= 378 \text{ cm}^2$	378 cm^2
11.	$\text{Area} = \frac{1}{2} \times 7 \times 5 - \frac{1}{2} \times 3 \times 5$ $= 17\frac{1}{2} - 7\frac{1}{2}$ $= 10 \text{ m}^2$	10 m^2
12.	Double dashed line segments $= 60$ cm [From $\frac{180 - 60}{2}$] $\text{Area} = 110 \times 60 + 120 \times 60 + \frac{60}{2}(70 + 110)$ $= 6600 + 7200 + 30 \times 180$ $= 6600 + 7200 + 5400$ $= 19\,200 \text{ cm}^2$	$19\,200 \text{ cm}^2$
13.	Radii are 5 cm and 10 cm $\text{Area} = \pi \times 10^2 - \pi \times 5^2$ $= 100\pi - 25\pi$ $= 75\pi$	$75\pi \text{ cm}^2$
14.	$\text{Area} = \frac{h}{2}(a + b)$ $480 = \frac{x}{2}(15 + 25)$ $480 = \frac{x}{2} \times 40$ $480 = x \times 20$ $x = \frac{480}{20}$ $x = 24$	$x = 24$
15.	$\text{Area} = \frac{150}{360} \times \pi \times 12^2$ $= \frac{5}{12} \times 144 \times \pi$ $= 5 \times 12\pi$ $= 60\pi \text{ cm}^2$	$60\pi \text{ cm}^2$

Year 9 *Area of Plane Shapes*

Calculator Allowed

Section 2 Multiple Choice Section

ANSWERS

No.	WORKING	ANSWER
1.	$\text{Area} = s^2$ $= 1.5^2$ $= 2.25\text{cm}^2$	A
2.	$1 \text{ square m} = 100 \text{ cm} \times 100 \text{ cm}$ $= 10\,000 \text{ cm}^2$ $0.5 \text{ m}^2 = 0.5 \times 10\,000$ $= 5\,000 \text{ cm}^2$	C
3.	$\text{Area} = 3.0 \times 1.8$ $= 5.4 \text{ cm}^2$	B
4.	$\text{Area} = \frac{1}{2} \times 200 \times 120$ $= 12\,000 \text{ cm}^2$	C
5.	$\text{Area} = 16^2 - 12^2$ $= 256 - 144$ $= 112 \text{ cm}^2$	B
6.	$\text{Area} = bh = 20 \times 20$ $= 400 \text{ m}^2$	C
7.	$\text{Area} = \frac{1}{2} \times 36 \times 85$ $= 1\,530 \text{ m}^2$	A
8.	$\text{Area} = \frac{19}{2}(25 + 33)$ $= \frac{19}{2} \times 58$ $= 551 \text{ cm}^2$	D
9.	$\text{Area} = 14 \times 5 + 3 \times 6$ $= 70 + 18$ $= 88 \text{ m}^2$	B

10.	$\text{Area} = \pi r^2 = \pi \times 14^2$ $= 615.8 \text{ cm}^2$	D
11.	$\text{Area} = \pi r^2$ $113 = \pi \times r^2$ $r^2 = \frac{113}{\pi} = 35.969...$ $r = \sqrt{35.969...}$ $= 5.997$ $= 6.0 \text{ m (nearest half metre)}$	D
12.	$\text{Area} = \frac{1}{2} \times 28 \times 15 + \frac{1}{2} \times 28 \times 16$ $= 210 + 224$ $= 434 \text{ m}^2$	A
13.	$\text{Area} = \frac{1}{2} \times \pi \times 7^2 = 76.9690$ $= 77.0 \text{ cm}^2$ (1 dec place)	A
14.	$\text{Area} = \text{trapezium} + \text{triangle} - \text{rectangle}$ $= \frac{2.2}{2}(4.5 + 6.5) + \frac{1}{2} \times 4.5 \times 1.2 - 0.8 \times 2.0$ $= 12.1 + 2.7 - 1.6$ $= 13.2 \text{ cm}^2$	B
15.	$\text{Area} = 30 \times 32 + \frac{1}{2} \times \pi \times 16^2$ $= 960 + 128\pi \text{ m}^2$	C

High School
Mathematics Test 2015

Multiple Choice Answer Sheet

Area of Plane Shapes

Name _____ANSWERS_____

Completely fill the response oval representing the most correct answer.

1.	A	●	B	○	C	○	D ○
2.	A	○	B	○	C	●	D ○
3.	A	○	B	●	C	○	D ○
4.	A	○	B	○	C	●	D ○
5.	A	○	B	●	C	○	D ○
6.	A	○	B	○	C	●	D ○
7.	A	●	B	○	C	○	D ○
8.	A	○	B	○	C	○	D ●
9.	A	○	B	●	C	○	D ○
10.	A	○	B	○	C	○	D ●
11.	A	○	B	○	C	○	D ●
12.	A	●	B	○	C	○	D ○
13.	A	●	B	○	C	○	D ○
14.	A	○	B	●	C	○	D ○
15.	A	○	B	○	C	●	D ○