School Name
Mathematics Test 2017

Year 9

Area of Plane Shapes

Non Calculator

Skills and Knowledge Assessed:

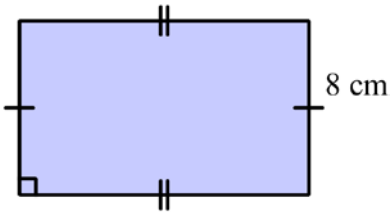
- Find perimeters and areas of parallelograms, trapeziums, rhombuses and kites (ACMMG196)
- Investigate the relationship between features of circles such as circumference, area, radius and diameter. Use formulas to solve problems involving circumference and area (ACMMG197)
- Choose appropriate units 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.
DIAGRAMS ARE NOT TO SCALE UNLESS OTHERWHISE STATED.

1. Calculate the area of this rectangle.



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2. What is the area of a square with sides 20 cm long?

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3. How many square metres are there in a square kilometre?

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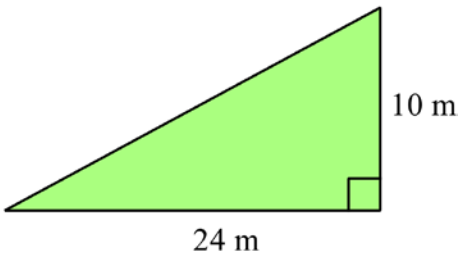
4. Find the area of the triangle shown.



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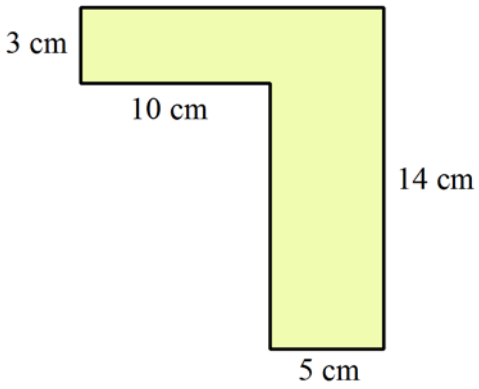
5. What is the area of this shape?



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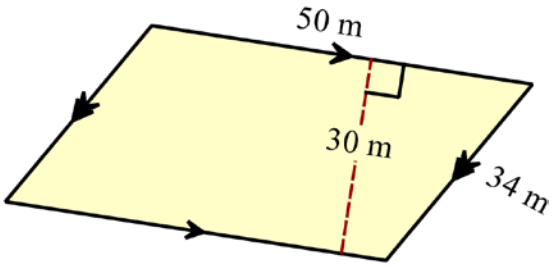
6. What is the area of the parallelogram shown?



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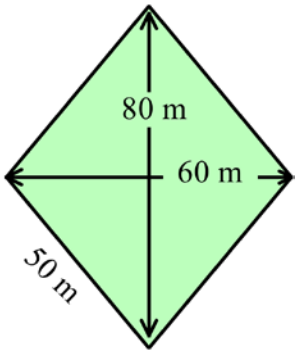
7. What is the area of this rhombus?



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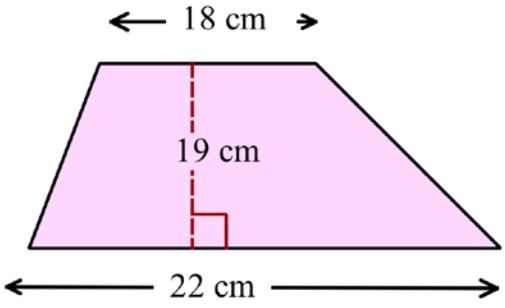
8. A trapezium has the dimensions shown.
What is its area?



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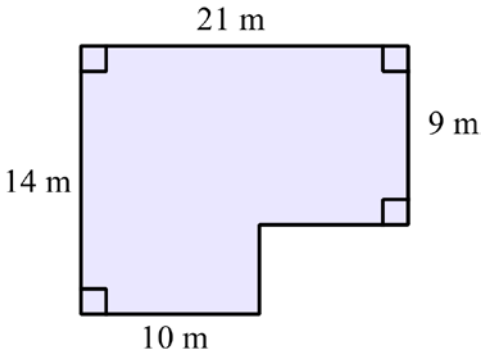
9. What is the area of this shape?



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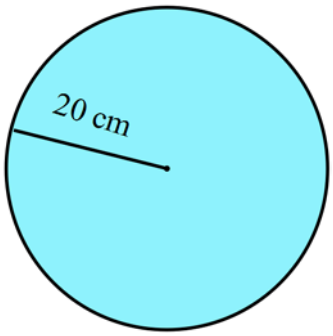
10. What is the area of this circle?
(Use $\pi = 3.14$.)



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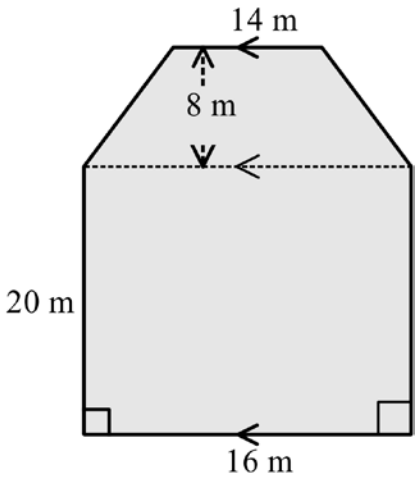
11. What is the area of this shape?



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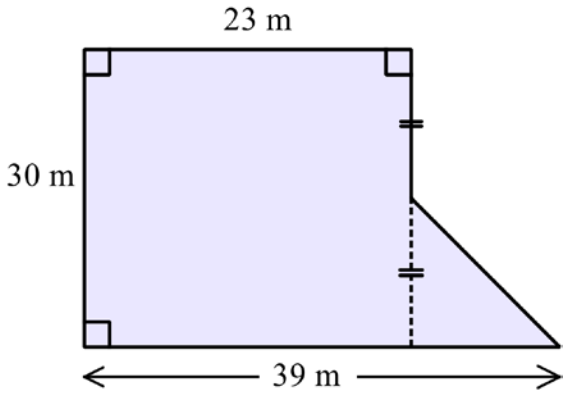
12. What is the area of this polygon?



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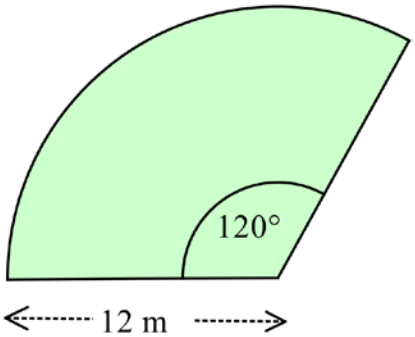
13. What is the area of this sector of a circle in terms of π ?



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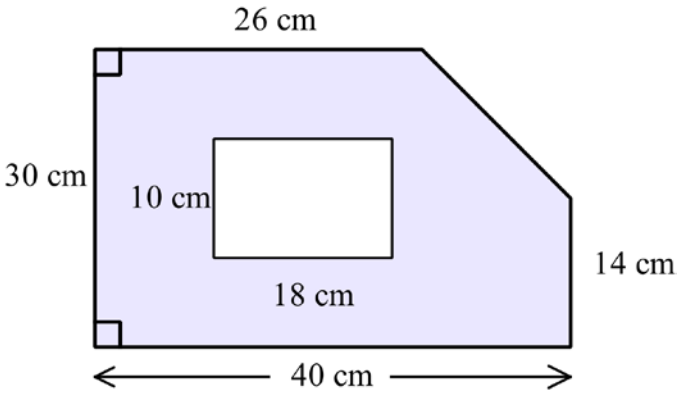
14. What is the shaded area in this diagram?



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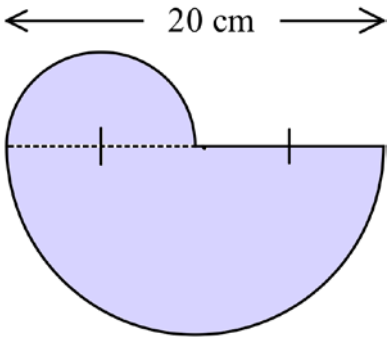
15. This shape is made up of two semicircles,
What is its area?



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School Name
Mathematics Test 2017

Calculator Allowed

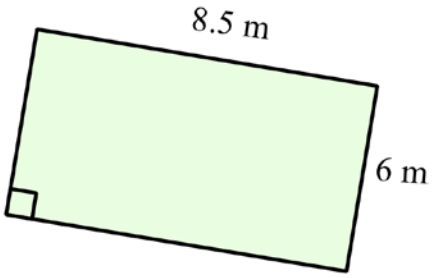
Year 9 **Area of Plane Shapes**

Name_____

Section 2 Multiple Choice Section

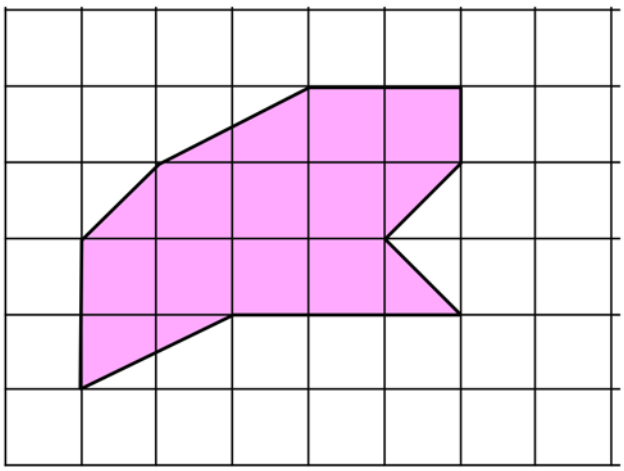
Mark all your answers on the accompanying multiple choice answer sheet, not on this test paper. You may do any working out on this test paper. Calculators are allowed for this section.

1. What is the area of this rectangle?



A. 14.5 m^2
B. 25.5 m^2
C. 29.0 m^2
D. 51.0 m^2

2. A shaded polygon is shown on a 1 cm grid background.
What is the area of the polygon?



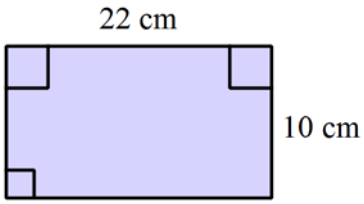
A. 12.5 cm^2
B. 13.0 cm^2
C. 13.5 cm^2
D. 14.5 cm^2

3. Which unit would be best to describe the area of a normal classroom?

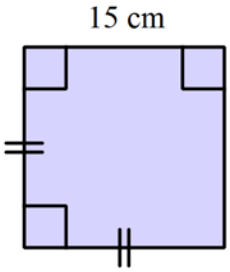
A. hectares
B. square centimetres
C. square metres
D. square kilometres

4. Which shape has an area of 225 cm^2 ?

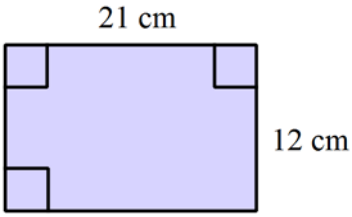
A.



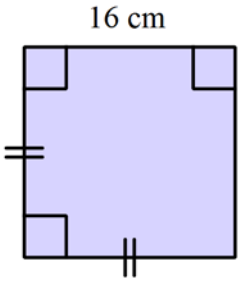
B.



C.



D.



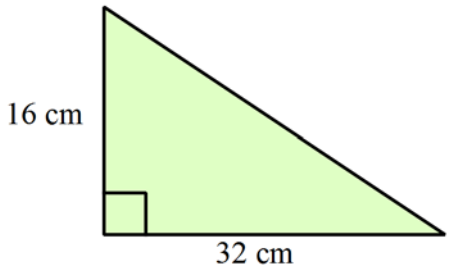
5. Which calculation could not be used to find the area of this triangle?

A. $\frac{1}{2} \times 16 \times 32$

B. 8×16

C. 8×32

D. 16×16



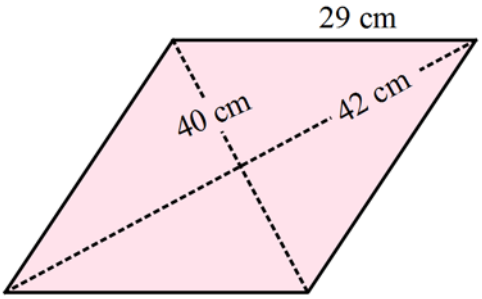
6. What is the area of the rhombus shown?

A. 840 cm^2

B. 1160 cm^2

C. 1189 cm^2

D. 1680 cm^2



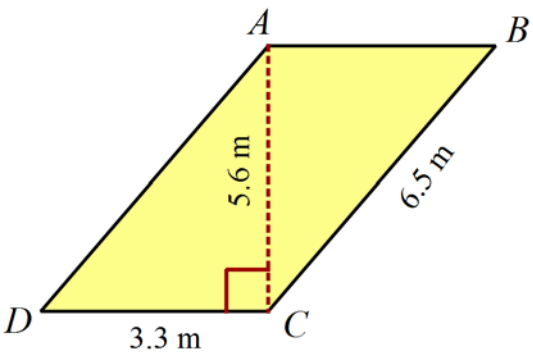
7. *ABCD* is a parallelogram.
What is its area in square metres?

A. 9.24 m^2

B. 10.725 m^2

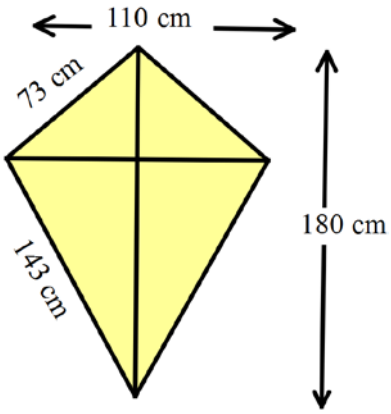
C. 18.48 m^2

D. 21.45 m^2



8. Taylah builds a kite with the dimensions shown.

What area of fabric is needed for the kite?



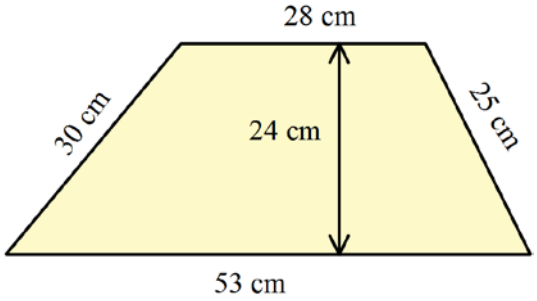
A. 5219.5 cm^2

B. 6570 cm^2

C. 7865 cm^2

D. 9900 cm^2

9. What is the area of the trapezium shown?



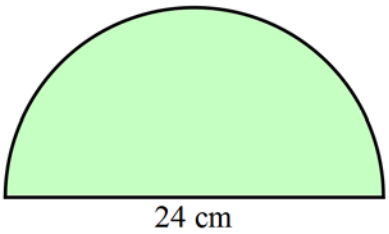
A. 660 cm^2

B. 972 cm^2

C. 996 cm^2

D. 1944 cm^2

10. What is the area of the semicircle shown (in terms of π)?



A. 72π cm^2

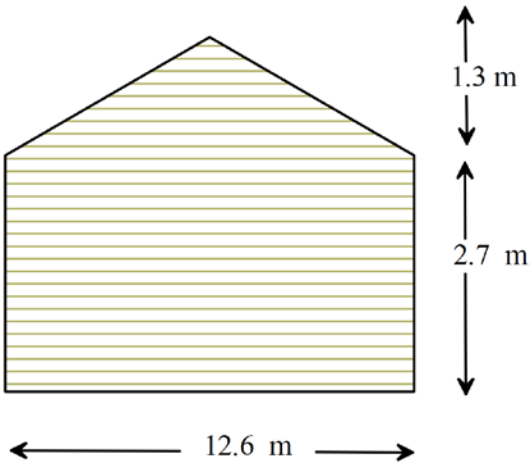
B. 144π cm^2

C. 288π cm^2

D. 576π cm^2

11. The wall of a house is in the shape of a pentagon, as shown.

Calculate the area of the wall.



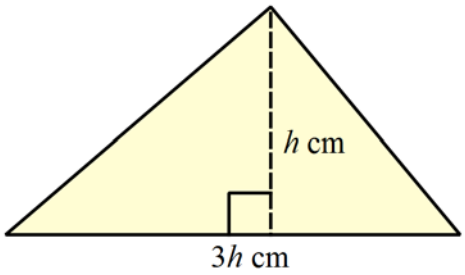
A. 18.765 m^2

B. 25.2 m^2

C. 42.21 m^2

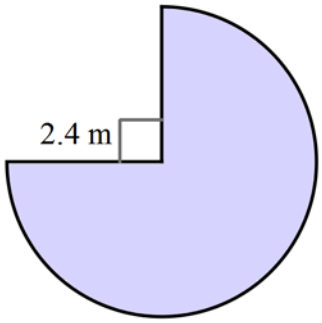
D. 50.4 m^2

12. The base of this triangle is three times the vertical height of the triangle.
The area of the triangle is 294 cm^2.
What is the vertical height?



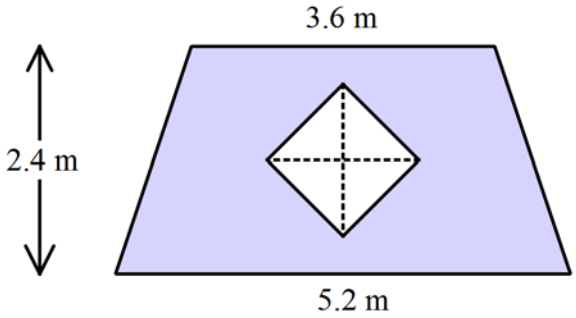
A. 7 cm
B. 14 cm
C. 16 cm
D. 18 cm

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



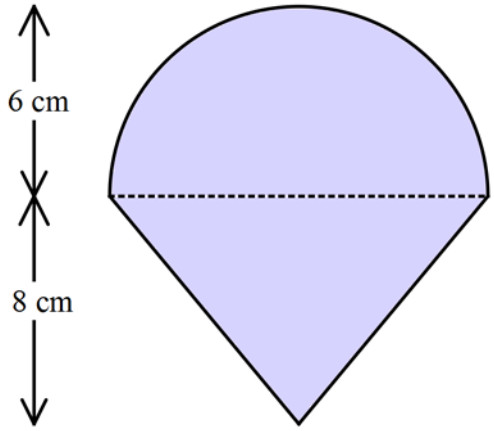
A. 3.4 m^2
B. 12.1 m^2
C. 13.6 m^2
D. 18.1 m^2

14. The wall shown, which is in the shape of a trapezium, is to be painted.
It has a square window in the middle, whose diagonals measure 1.6 m.
What is the area to be painted?



A. 9.28 m^2
B. 11.84 m^2
C. 13.12 m^2
D. 19.84 m^2

15. Find the area of the shape shown to the nearest 100^{th} of a square metre.



A. 72.55 cm^2
B. 80.55 cm^2
C. 92.55 cm^2
D. 104.55 cm^2

School Name

Mathematics 2017

Multiple Choice Answer Sheet

Area of Plane Shapes

Name _____

Completely fill the response oval representing the most correct answer.

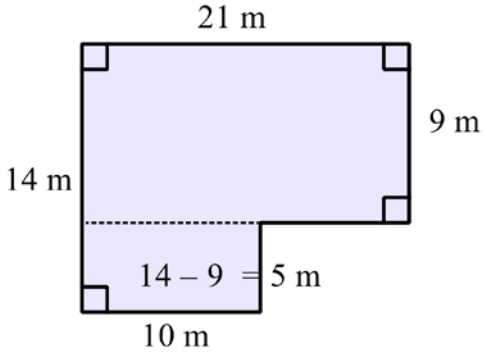
1.	A ⬭	B ⬭	C ⬭	D ⬭
2.	A ⬭	B ⬭	C ⬭	D ⬭
3.	A ⬭	B ⬭	C ⬭	D ⬭
4.	A ⬭	B ⬭	C ⬭	D ⬭
5.	A ⬭	B ⬭	C ⬭	D ⬭
6.	A ⬭	B ⬭	C ⬭	D ⬭
7.	A ⬭	B ⬭	C ⬭	D ⬭
8.	A ⬭	B ⬭	C ⬭	D ⬭
9.	A ⬭	B ⬭	C ⬭	D ⬭
10.	A ⬭	B ⬭	C ⬭	D ⬭
11.	A ⬭	B ⬭	C ⬭	D ⬭
12.	A ⬭	B ⬭	C ⬭	D ⬭
13.	A ⬭	B ⬭	C ⬭	D ⬭
14.	A ⬭	B ⬭	C ⬭	D ⬭
15.	A ⬭	B ⬭	C ⬭	D ⬭

School Name
Mathematics Test 2017

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

ANSWERS

Question	Working and Answer
1.	Area $= lb$ $= 8 \times 15$ $= \mathbf{120\ cm^2}$
2.	Area $= 20^2$ $= \mathbf{400\ cm^2}$
3.	$1\ km = 1000\ m$ $1\ km^2 = 1000 \times 1000\ m^2$ $= \mathbf{1000\ 000\ m^2}$
4.	Area $= \frac{1}{2}bh$ $= \frac{1}{2} \times 24 \times 10$ $= 12 \times 10$ $= \mathbf{120\ m^2}$
5.	Area $= 3 \times 10 + 5 \times 14$ $= 30 + 70$ $= \mathbf{100\ cm^2}$
6.	Area $= bh$ $= 50 \times 30$ $= \mathbf{1500\ m^2}$
7.	Area $= \frac{1}{2}xy$ $= \frac{1}{2} \times 60 \times 80$ $= 30 \times 80$ $= \mathbf{2400\ m^2}$

Question	Working and Answer
8.	$\text{Area} = \frac{h}{2}(a + b)$ $= \frac{19}{2}(18 + 22)$ $= \frac{19}{2} \times \ \times \ 40$ $= 19 \times 20$ $= \mathbf{380\ cm^2}$
9.	$\text{Area} = 10 \times 5 + 21 \times 9$ $= 50 + 189$ $= \mathbf{239\ m^2}$ 
10.	$\text{Area} = \pi r^2$ $= \pi \times 20^2$ $= 3.14 \times 400$ $= \mathbf{1256.00\ cm^2}$
11.	$\text{Area} = \frac{8}{2}(14 + 16) + 20 \times 16$ $= 4 \times 30 + 320$ $= 120 + 320$ $= \mathbf{440\ m^2}$
12.	Triangle has height 15 cm and base 16 cm $\text{Area} = \frac{1}{2} \times 16 \times 15 + 30 \times 23$ $= 8 \times 15 + 690$ $= 120 + 690$ $= \mathbf{810\ m^2}$ Can also be broken into rectangle and trapezium.
13.	$\text{Area} = \frac{120}{360} \times \pi \times 12^2$ $= \frac{1}{3} \times 12 \times 12 \times \pi$ $= 4 \times 12 \times \pi$ $= \mathbf{48\ \pi\ m^2}$

Question	Working and Answer
14.	Triangle cut from corner has height 16 cm and base 14 cm $\text{Area} = 30 \times 40 - \frac{1}{2} \times 16 \times 14 - 10 \times 18$ $= 1200 - 8 \times 14 - 180$ $= 1200 - 112 - 180$ $= 1200 - 292$ $\mathbf{= 908\ cm^2}$
15.	Larger semicircle has radius 10 cm and the smaller has radius 5 cm $\text{Area} = \frac{1}{2} \times \pi \times 5^2 + \frac{1}{2} \times \pi \times 10^2$ $= \frac{25\pi}{2} + \frac{100\pi}{2}$ $= \mathbf{\frac{125\pi}{2}\ cm^2}$

School Name
Mathematics Test 2017

Year 9

Area of Plane Shapes

Calculator Allowed
Multiple Choice
Section

ANSWERS

Question	Working	M C Answer
1.	Area $= l\,b$ $= 6 \times 8.5$ $= 51.0\ \text{m}^2$	**D**
2.	9 complete square cm. 3.5 cm^2 of part squares. Area = 12.5 cm^2	**A**
3.	Hectares and square kilometres are too large a units and square centimetres is too small a unit, so the best is square metres.	**C**
4.	*A*. Area $= 22 \times 10 = 220\ \text{cm}^2$ *B*. Area $= 15^2 = 225\ \text{cm}^2$ *C*. Area $= 21 \times 12 = 252\ \text{cm}^2$ *D*. Area $= 16^2 = 256\ \text{cm}^2$	**B**
5.	Area $= \frac{1}{2}\,b\,h$ $= \frac{1}{2} \times 32 \times 16$ $= \frac{1}{2} \times 16 \times 32$ $= 8 \times 32$ $= 16 \times 16$ $\neq 8 \times 16$	**B**
6.	Area $= \frac{1}{2}x\,y$ $= \frac{1}{2} \times 40 \times 42$ $= 840\ \text{cm}^2$	**A**

7.	Area $= b\,h$ $= 3.3 \times 5.6$ $= 18.48\ \text{m}^2$	**C**
8.	Area $= \frac{1}{2} x\,y$ $= \frac{1}{2} \times 110 \times 180$ $= 9900\ \text{cm}^2$	**D**
9.	Area $= \frac{h}{2}(a + b)$ $= \frac{24}{2}(28 + 53)$ $= 972\ \text{cm}^2$	**B**
10.	radius $= 12$ cm Area $= \frac{1}{2} \times \pi r^2$ $= \frac{1}{2} \times \pi \times 12^2$ $= \frac{1}{2} \times \pi \times 144$ $= 72\pi\ \text{cm}^2$	**A**
11.	Area $= 2.7 \times 12.6 + \frac{1}{2} \times 12.6 \times 1.3$ $= 34.02 + 8.19$ $= 42.21\ \text{m}^2$	**C**
12.	Area $= \frac{1}{2} b\,h$ $294 = \frac{1}{2} \times 3h \times h$ $588 = 3h^2$ $196 = h^2$ $h = \sqrt{196}$ $= 14$ cm Or can be done by trial and error with the options given.	**B**
13.	Sector is $\frac{3}{4}$ of a circle. Area $= \frac{3}{4} \times \pi r^2$ $= \frac{3}{4} \times \pi \times 2.4^2$ $= 13.57168...$ $= 13.6\ \text{m}^2$ (1 dec pl)	**C**

14.	$\text{Area} = \frac{2.4}{2}(3.6 + 5.2) - \frac{1}{2} \times 1.6 \times 1.6$ $= 10.56 - 1.28$ $= 9.28 \text{ m}^2$	**A**
15.	The radius is 6 cm, so base of triangle is 12 cm (diameter). $\text{Area} = \frac{1}{2} \times \pi \times 6^2 + \frac{1}{2} \times 12 \times 8$ $= 56.548... + 48$ $= 104.548...$ $= 104.55 \text{ cm}^2$ (nearest hundredth)	**D**

School Name

Mathematics 2017

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 ●