School Name
Mathematics Test 2017

Year 9 **Basic Measurement** Non Calculator

Skills and Knowledge Assessed:

- Choose appropriate units of measurement for area and volume and convert from one unit to another (ACMMG195)
- 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)
- Investigate very small and very large time scales and intervals. (ACMMG219)
- Express numbers in scientific notation (ACMNA210)

Name_____

Section 1 Short Answer Section

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

1. Write 3.25 kg as a mass in grams.

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2. What is the time $2\frac{3}{4}$ hours before 11:30 pm?

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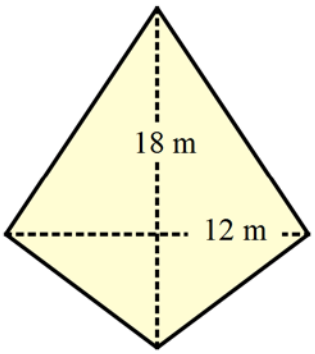
   …….

3. What is the area of the kite shown?

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4. Write the number two hundred and fifty million in scientific notation.

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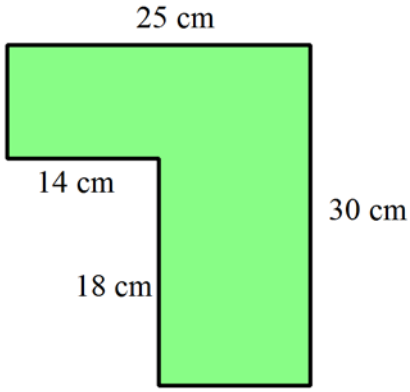
5. What is the area of the shape shown?



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6. How many litres of water would be held in a dozen bottles, each of which holds 600 millilitres.

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7. Rick needs to be at an appointment at 2:15 pm.

It will take him 55 minutes to travel to the appointment.

The current time in the morning is shown on the clock at right.

How long does he have before he must leave for the appointment?

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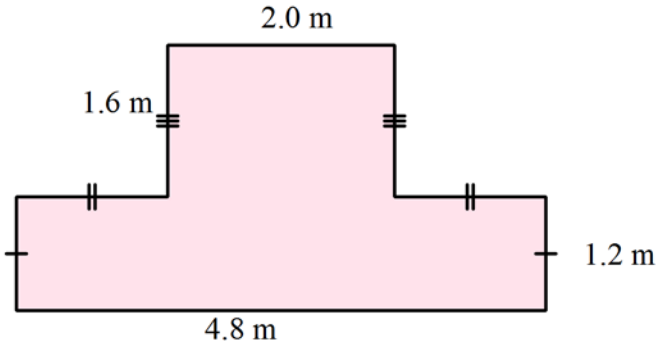
8. In the polygon shown, all adjacent sides are perpendicular.

What is the perimeter of the polygon?



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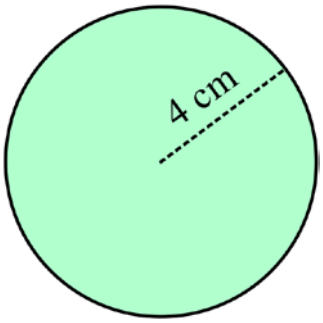
9. What is the circumference of this circle?

(Use $\pi = 3.14$)



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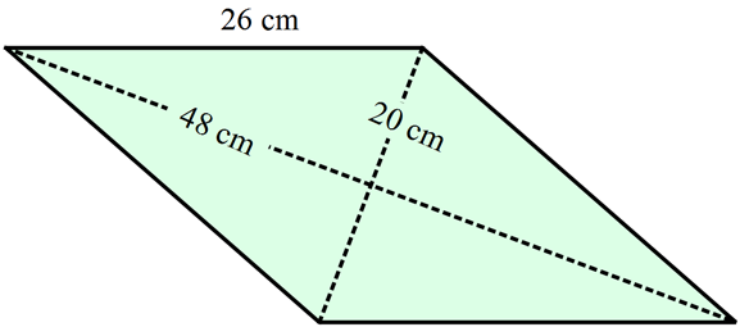
10. Find the area of this rhombus.



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11. A large screen TV has an area of 3 million square millimetres.

What is this area in square metres?

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12. Dinosaurs originated around 231 million years ago and they became extinct about 66 million years ago.

Write in Standard Notation, the amount of time that passed between their origin and extinction.

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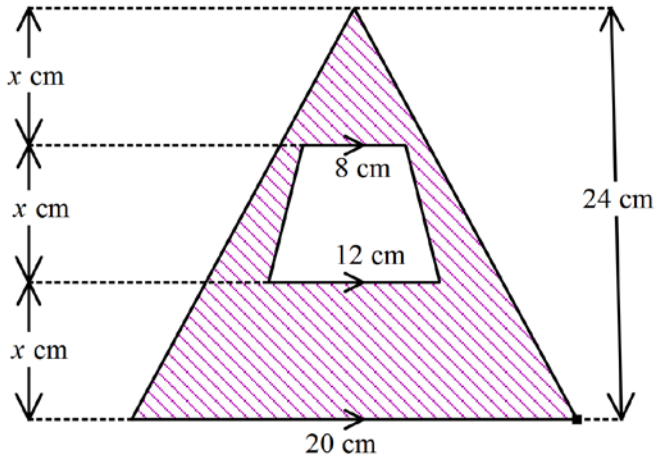
13. Find the area of the shaded section of this shape.

The distances marked *x* are all equal.



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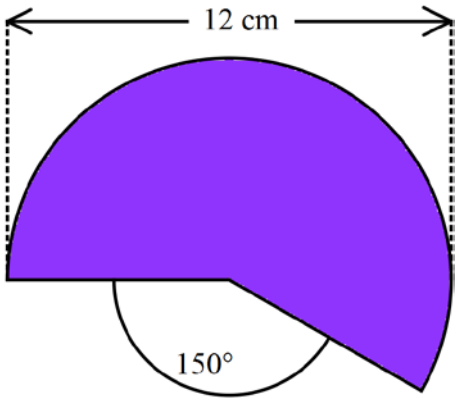
14. Find the area of the shaded sector, in terms of π.



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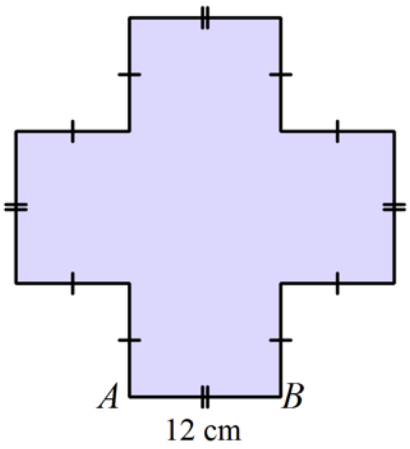
15. The shape shown has a perimeter of 120 cm.
All adjacent sides are perpendicular.
The distance AB = 12 cm.
Calculate the area of the shape.



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School Name
Mathematics Test 2017

Year 9 *Basic Measurement*

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. Which of the intervals below is closest to 11.6 cm in length?

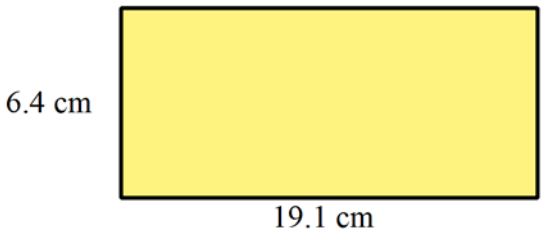
   A. _____
   B. _____
   C. _____
   D. _____

2. Mary leaves home at 11:45 am and takes an hour and 35 minutes to get to an appointment in a nearby town.

   What time does she arrive?

   A. 12: 20 pm B. 12: 40 pm C. 1: 20 pm D. 1: 40 pm

3. What is the perimeter of this rectangle?

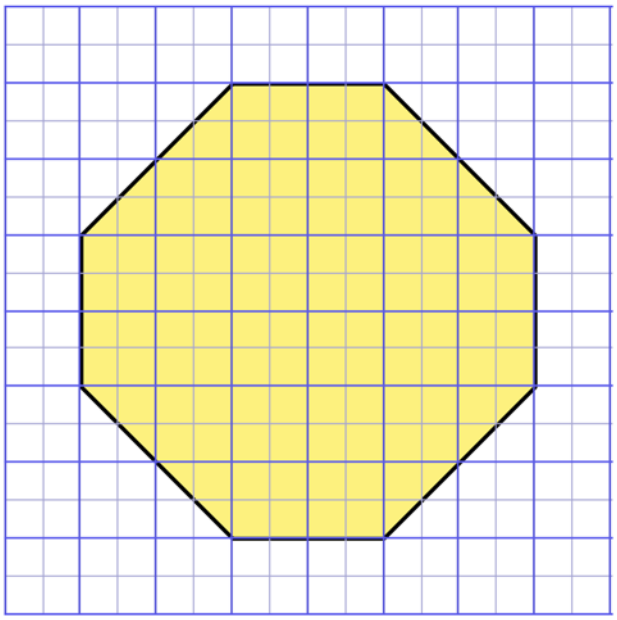


NOT TO SCALE

   A. 25.5 cm B. 31.9 cm C. 50.5 cm D. 51.0 cm

4. An octagon is drawn on a grid.

Estimate the area of the octagon.



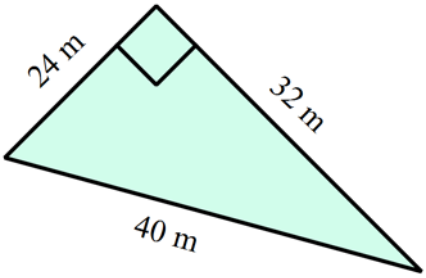
A. 24 cm^2

B. 26 cm^2

C. 28 cm^2

D. 32 cm^2

5. Calculate the area of the triangle.



NOT TO SCALE

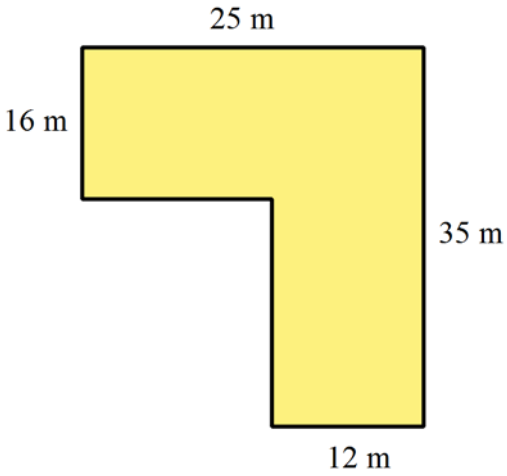
A. 96 m^2

B. 384 m^2

C. 480 m^2

D. 640 m^2

6. What is the area of this shape?



NOT TO SCALE

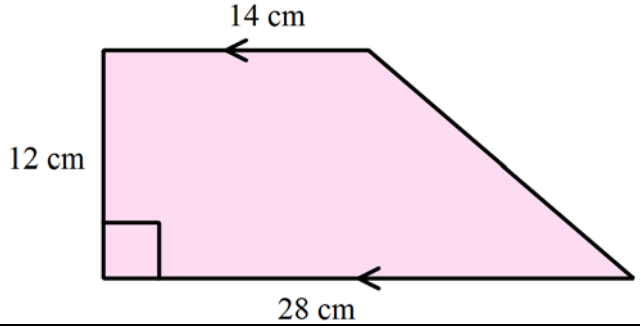
A. 260 m^2

B. 628 m^2

C. 683 m^2

D. 875 m^2

7. What is the area of this trapezium?



NOT TO SCALE

A. 252 cm^2

B. 336 cm^2

C. 504 cm^2

D. 853 cm^2

Questions 8 – 9 refer to the train timetable below.

Perth Station	6:23 pm	6:45 pm	7:27 pm	7:54 pm	8:15 pm
City West	6:25 pm	6:47 pm	7:29 pm	7:56 pm	8:17 pm
West Leederville	6:27 pm	6:49 pm	7:31 pm	7:58 pm	8:19 pm
Subiaco	6:29 pm	6:51 pm	7:33 pm	8:00 pm	8:21 pm
Daglish	6:30 pm	6:52 pm	7:34 pm	8:01 pm	8:22 pm
Shenton Park	6:32 pm	6:54 pm	7:36 pm	8:03 pm	8:24 pm
Karrakatta	6:34 pm	6:56 pm	7:38 pm	8:15 pm	8:26 pm
Loch Street	6:35 pm	6:57 pm	7:39 pm	8:16 pm	8:27 pm
Claremont	6:37 pm	6:59 pm	7:41 pm	8:18 pm	8:29 pm
Swanbourne	6:39 pm		7:43 pm	8:20 pm	
Grant Street	6:40 pm		7:44 pm	8:21 pm	
Cottesloe	6:42 pm		7:46 pm	8:23 pm	
Mosman Park	6:44 pm		7:48 pm	8:25 pm	
Victoria Street	6:45 pm		7:49 pm	8:26 pm	
North Fremantle	6:47 pm		7:51 pm	8:28 pm	
Fremantle	6:51 pm	7:08 pm	7:55 pm	8:32 pm	8:38 pm

8. How many minutes less does it take to get from Perth to Fremantle on the 6:45 train compared to the 6:23 train?

A. 2 minutes B. 3 minutes C. 4 minutes D. 5 minutes

9. Kaylee is at Subiaco and needs to get to Cottesloe by 7:30 pm.

What time should she catch a train?

A. 6:23 pm B. 6:45 pm C. 6:29 pm D. 6:51 pm

10. The distance from the equator of a satellite is 3.6×10^4 km.

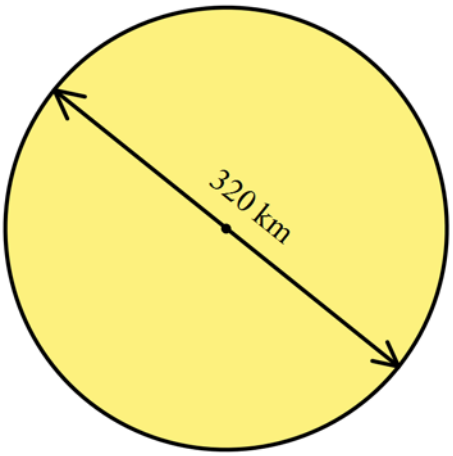
What is this distance, when written as a normal numeral?

A. 3 600 km B. 36 000 km C. 360 000 km D. 3 600 000 km

11. The circle represents the range of a ground radar.

What is the area of the circle?

(Answer to the nearest 100 km^2.)



A. 20 100 km^2

B. 25 600 km^2

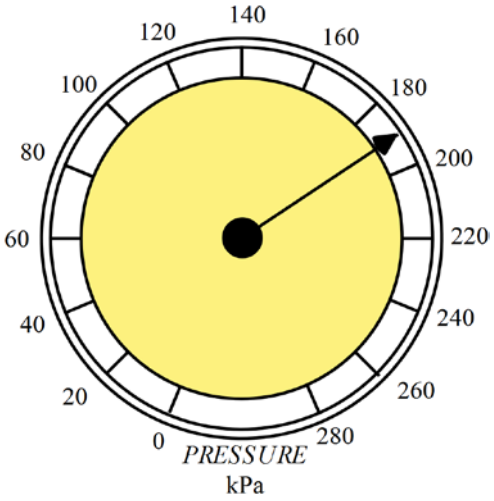
C. 80 400 km^2

D. 321 700 km^2

12. Julia uses the gauge shown to measure the tyre pressure in her front tyres.

The manufacturers recommend a pressure of 220 kPa.

By how much should she adjust the pressure to reach the recommended pressure?



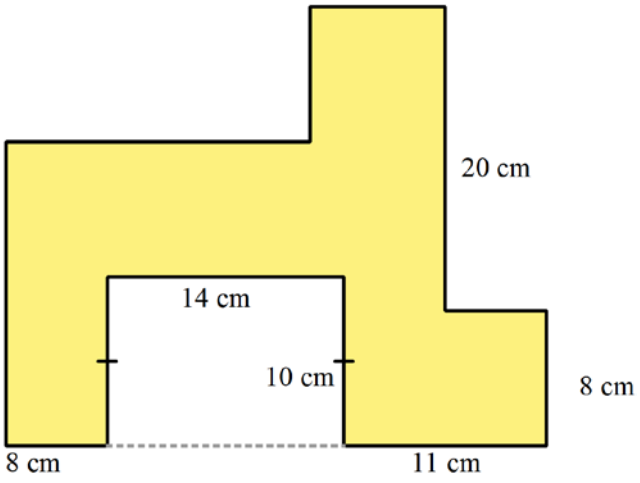
A. Decrease it by 15 kPa.

B. Increase it by 15 kPa.

C. Increase it by 25 kPa.

D. Increase it by 30 kPa.

13. What is the perimeter of the shape shown?



A. 142 cm

B. 152 cm

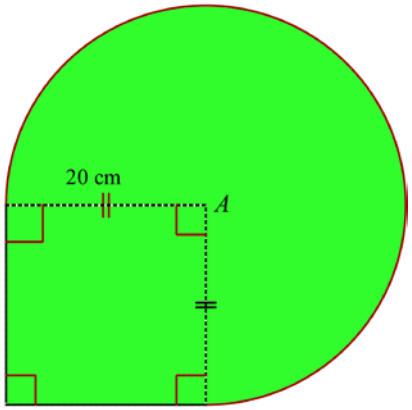
C. 160 cm

D. 162 cm

14. It takes about 3.38 microseconds for light to travel a kilometre in a vacuum.
About how long would it take light to travel 5 000 000 km?

A. 15 seconds B. 17 seconds C. 20 seconds D. 34 seconds

15. A is the centre of the circle.
What is the area of the shaded shape?



A. 1342.5 cm^2
B. 1656.6 cm^2
C. 4170.0 cm^2
D. 5026.5 cm^2

School Name

Mathematics 2017

Multiple Choice Answer Sheet

Basic Measurement

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 — *Basic Measurement* — Non Calculator Section

ANSWERS

Question	Working and Answer
1.	3.25 kg = $3.25 \times 1000\,g$ = **3 250 grams**
2.	$2\frac{3}{4}$ hours = 2 hours and 45 minutes 45 min before 11:30 pm is 10:45 pm 2 hrs before 10:45 pm is **8:45 pm.**
3.	Area = $\frac{1}{2} x\, y$ $= \frac{1}{2} \times 18 \times 12$ $= 9 \times 12$ $=$ **108 m^2**
4.	250 000 000 = **2.5×10^8**
5.	Area = $25 \times 30 - 18 \times 14$ $= 750 - 252$ **$= 498$ cm^2**
6.	600 mL = 0.6 litres. Amount 12 Bottles hold = 0.6×12 **= 7.2 litres**
7.	55 minutes befor 2:15 pm is 1:20 pm. Time from 11:40 am to 1: 20 pm = 1:20 +20 min **= 1 hour and 40 minutes**
8.	Total of horizontal sides = $2 \times 4.8 = 9.6\,m$ Total of vertical sides = $2 \times (1.6 + 1.2) = 2 \times 2.8 = 5.6\,m$ Perimeter = 9.6 + 5.6 = **15.2 *m***
9.	Circumference = $\pi \times d$ $= 3.14 \times 8$ **$= 25.12$ cm**

Question	Working and Answer
10.	Area $= \frac{1}{2} \times x \times y$ $= \frac{1}{2} \times 48 \times 20$ $= 48 \times 10$ $=$ **480 cm^2**
11.	Each square metre measures 1000 mm by 1000 mm, so has an area of 1 000 000 mm^2. So 3 million mm^2 is **3 square metres.**
12.	231 million $-$ 66 million $=$ 165 million years $=$ 165 000 000 $=$ **1.65 $\times$ 10^8**
13.	$x = 24 \div 3 = 8$ cm Area triangle $= \frac{1}{2} \times 20 \times 24$ $=$ 240 cm^2 Area trapezium $= \frac{8}{2}(8 + 12)$ $=$ 80 cm^2 Shaded area $=$ 240 $-$ 80 $=$ **160 cm^2**
14.	Diameter of circle $=$ 12 cm, so $r =$ 6 cm. Internal angle of sector $=$ 360 – 150 $=$ 210° Area $= \frac{210}{360} \times \pi \times 6^2$ $= \frac{7}{12} \times 36 \times \pi$ $= 7 \times 3 \times \pi$ $=$ **21 π cm^2**
15.	There are 3 other sides equal to AB, so the total length of these 4 sides $= 4 \times 12 = 48$ cm There are 8 other sides which are equal, whose total length $= 120 - 48 = 72$ cm Length of each of these other sides $= 72 \div 8 =$ 9cm. Shape can now be divided into a central square measuring 12 cm by 12 cm and 4 surrounding rectangles measuring 9 cm by 12 cm. Area square $=$ 144 cm^2 Area rectangles $= 4 \times 9 \times 12 =$ 432 cm^2 Total area of shape $= 144 + 432 =$ **576 cm^2.**

School Name
Mathematics Test 2017

Year 9

Basic Measurement

Calculator Allowed
Multiple Choice
Section

ANSWERS

Question	Working	M C Answer
1.	The lengths are in order 11.6 cm, 11.2 cm, 12.0 cm and 11.3 cm.	**A**
2.	$11:45\text{ am} + 1:35 = 12:45\text{ pm} + 0:35$ $= 12:45\text{ pm} + 0:15 + 0:20$ $= 1:00\text{ pm} + 0:20$ $= 1:20\text{ pm}$	**C**
3.	$\text{Perimeter} = 2 \times (6.4 + 19.1)$ $= 2 \times 25.5$ $= 51.0\text{ cm}$	**D**
4.	There are 24 complete square centimetres and another 8 half square cm. Area = 24 + 4 = 28 cm^2	**C**
5.	$\text{Area} = \frac{1}{2} \times b \times h$ $= \frac{1}{2} \times 24 \times 32$ $= 384\text{ m}^2$	**B**
6.	$\text{Area} = 16 \times 25 + (35 - 16) \times 12$ $= 16 \times 25 + 19 \times 12$ $= 400 + 228$ $= 628\text{ m}^2$	**B**
7.	$A = \frac{12}{2}(14 + 28)$ $= 6 \times 42$ $= 252\text{ cm}^2$	**A**

8.	The 6:23 train arrives at 6:51, so takes 51 – 23 = 28 minutes. The 6:45 train arrives at 7:08, so takes 60 – 45 + 8 = 23 minutes. It takes 28 – 23 = 5 minutes less.	**D**
9.	The 6:49 train does not stop at Cottesloe and all later trains would be too late, so she must catch the 6:29 train.	**C**
10.	3.6×10^4 km Move the decimal point one place for each power of 10, so 36 000 km.	**B**
11.	Radius = 160 km. Area = $\pi \times 160^2$ $= 80424.77193$ $= 80\,400$ km (nearest 100 km^2)	**C**
12.	Current is 190 kPa. Change = 220 – 190 = 30 kPa increase.	**D**
13.	Total of RH vertical sides = 20 + 8 = 28 cm, so LH vertical sides also = 28 cm. Total of bottom horizontal sides = 8 + 14 + 11 = 33 cm, so top horizontal sides also = 33 cm. Two vertical inserts are both 10 cm. Perimeter = $28 \times 2 + 33 \times 2 + 10 \times 2$ $= 56 + 66 + 20 +$ $= 142$cm	**A**
14.	A microsecond is 1 millionth of a second. Time taken = $\frac{3.38}{1000000} \times 5000000 = 3.38 \times 5 = 16.9$ seconds So about 17 seconds.	**B**
15.	Area = $\pi \times 20^2 \times \frac{3}{4} + 20^2$ $= 942.4778 + 400$ $= 1\,342.5$ cm^2	**A**

School Name

Mathematics 2017

Multiple Choice Answer Sheet

Basic Measurement

Marking Sheet

Completely fill the response oval representing the most correct answer.