High School Mathematics Test 2015

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. Use a ruler to measure the length (longest side) of the shaded rectangle below, to the nearest mm.

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2. A basketball match starts at 7:50pm and lasts for 55 minutes.
What time does it finish?

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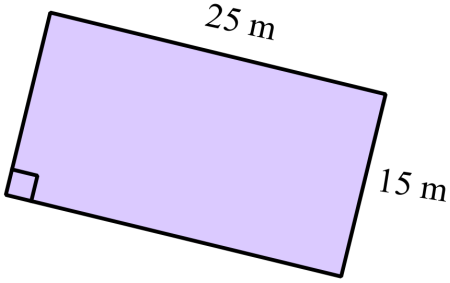
3. What is the perimeter of this rectangle?



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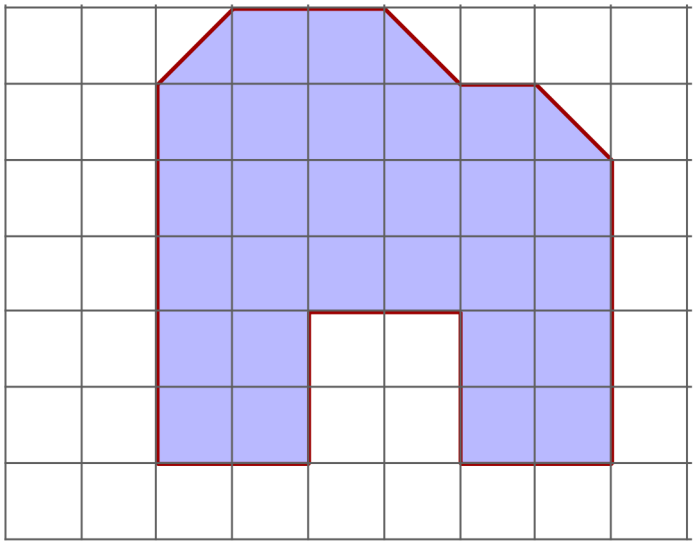
4. The shaded shape is drawn on 1 cm grid.

What is the area of the shape?



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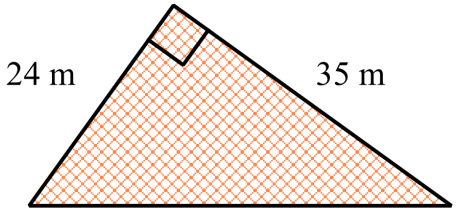
5. What is the area of the triangle?



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Questions 6 – 7 refer to the train timetable below.

Perth Station	5:23 am	6:27 am	6:54 am	7:08 am
City West	5:25 am	6:29 am	6:56 am	7:10 am
West Leederville	5:27 am	6:31 am	6:58 am	7:12 am
Subiaco	5:29 am	6:33 am	7:00 am	7:14 am
Daglish	5:30 am	6:34 am	7:01 am	7:15 am
Shenton Park	5:32 am	6:36 am	7:03 am	7:17 am
Karrakatta	5:34 am	6:38 am	7:05 am	7:19 am
Loch Street	5:35 am	6:39 am	7:06 am	7:20 am
Claremont	5:37 am	6:41 am	7:08 am	7:22 am
Swanbourne	5:39 am	6:43 am	7:10 am	
Grant Street	5:40 am	6:44 am	7:11 am	
Cottesloe	5:42 am	6:46 am	7:13 am	
Mosman Park	5:44 am	6:48 am	7:15 am	
Victoria Street	5:45 am	6:49 am	7:16 am	
North Fremantle	5:47 am	6:51 am	7:18 am	
Fremantle	5:51 am	6:55 am	7:22 am	7:31 am

6. How long does it take to get from Subiaco to Freemantle on the train which leaves at 6:33?

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7. Ivy was 12 minutes too late to catch the 5:40 train from Grant St.
How many more minutes must she wait for the next train to arrive to take her to Freemantle?

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8. Two blocks of land are shown.
The area of Block A is 2 hectares.
What is the area of Block B in hectares?

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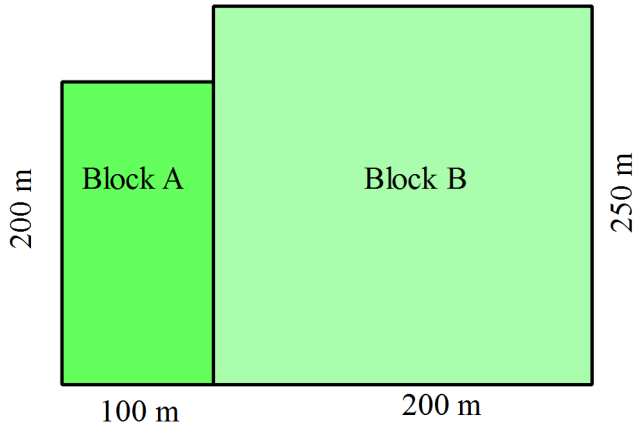

9. What is the area of this rhombus?

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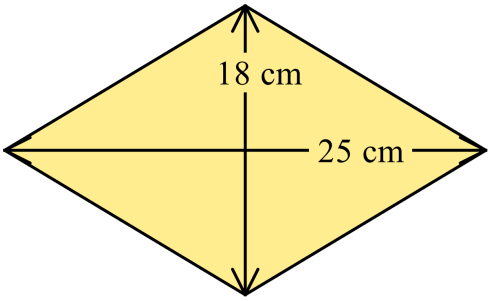

10. The distance that an airliner has travelled in its service life is given as 6.2×10^7 km.
Write this distance as a normal numeral.

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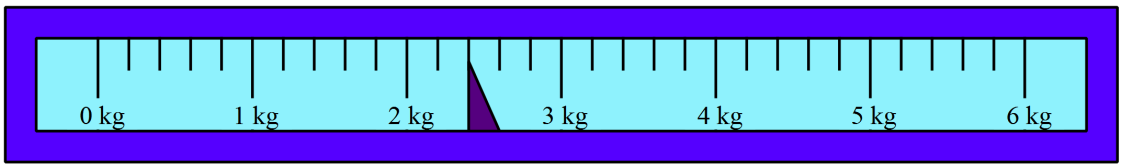
11. Hermione weighs a roast before putting it in the oven.

The scale shows it's mass.



The cooking guide says to cook for 30 minutes per 500 grams.

How long (in hours and minutes) should she cook the roast?

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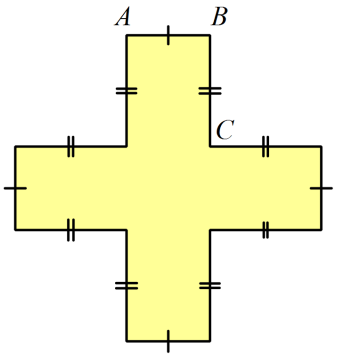
12. The distance *BC* is 12 cm.
The perimeter of this shape is 132 cm.
What is the distance AB?



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13. Sam is researching pre-history, and finds an event that is estimated to have occurred 240 millennia ago.

If a millennia is a thousand years, write this time in years using scientific notation.

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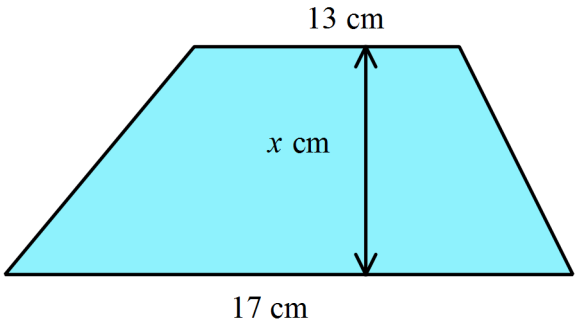
14. The trapezium shown has an area of 450 cm^2.

The perpendicular height is x cm.

What is the value of x?



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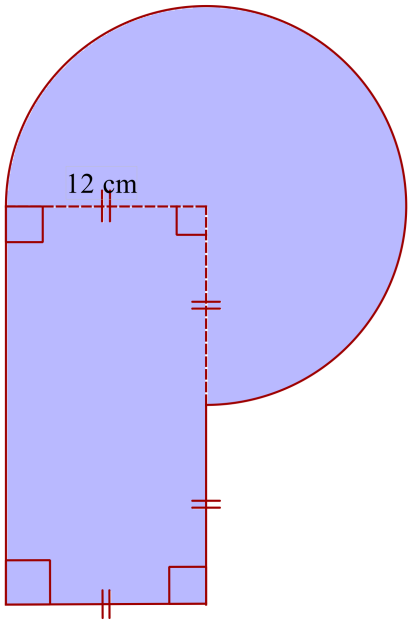
15. What is the area of the shaded shape, in terms of π ?



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High School Mathematics Test 2015

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 measurement is the same as 6 500 ml?

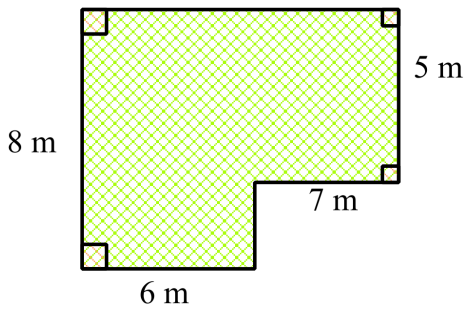
   A. 0.65 litres B. 6.5 litres C. 65 litres D. 0.65 kilolitres

2. The time on Andrew's phone is 18:45.
   He needs to meet a friend at a quarter past eight to go to a movie.
   How much time does he have before they meet?

   A. Half an hour B. An hour C. An hour and a half D. 2 hours

3. What is the area of this shape?

   A. 26 m^2
   B. 53 m^2
   C. 82 m^2
   D. 83 m^2



4. The distance from Earth to Neptune is about 4 290 000 000 km at its' nearest. What is this in Scientific Notation?

   A. 4.29×10^9 B. 4.29×10^{10} C. 42.9×10^8 D. 42.9×10^9

5. *ABCD* is a parallelogram.

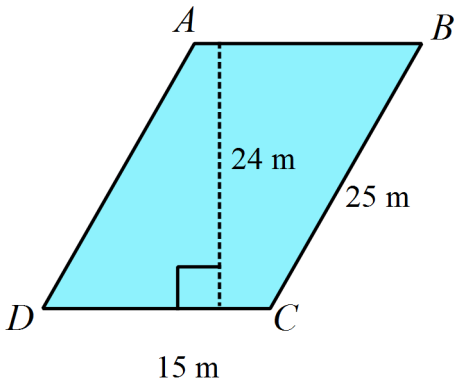
What is its area in square metres?

A. $128\ m^2$

B. $300\ m^2$

C. $360\ m^2$

D. $375\ m^2$



6. Mikey stacks 800 bricks which each have a mass of 1.5 kg onto a pallet.

The pallet itself weighs 50 kg.

What is the weight of the full pallet of bricks?

A. 1.25 tonnes B. 1.5 tonnes

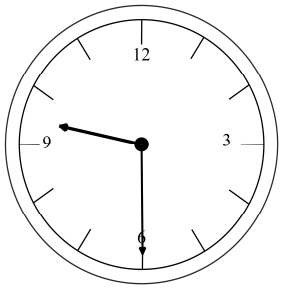
C. 12.5 tonnes D. 15 tonnes

7. Liza went to bed at the time shown on the clock on her wall.

She slept for $8\frac{1}{2}$ hours.

She then took an hour and 20 minutes to get ready for school and get to the bus stop.

What time did she reach the bus stop?



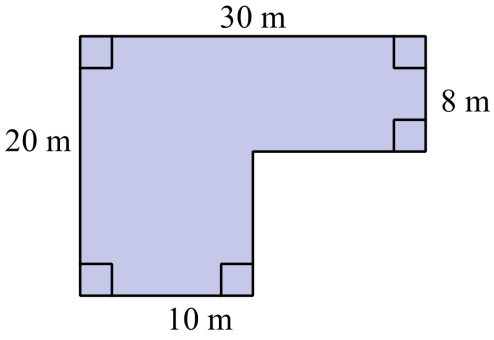
A. 7:20 am.

B. 7:40 am.

C. 8:10 am.

D. 8:20 am.

8. What is the perimeter of this shape?



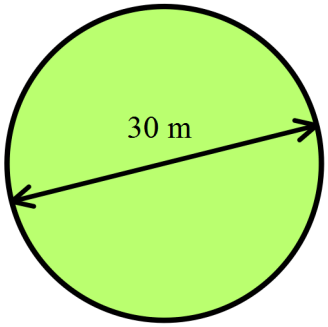
A. 68 m

B. 80 m

C. 88 m

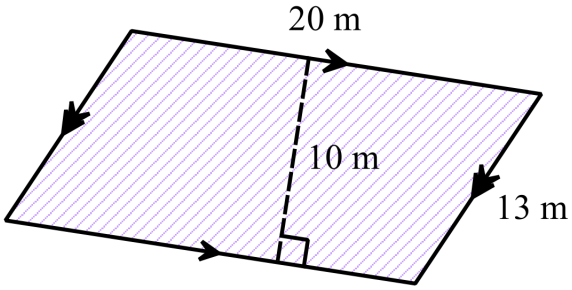
D. 100 m

9. The circle has a diameter of 30 m.
What is its circumference?



A. 15π m
B. 30π m
C. 60π m
D. 90π m

10. What is the area of the parallelogram shown?

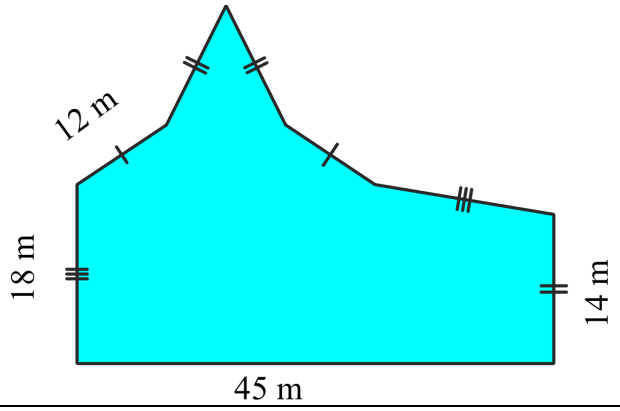


A. 100 m^2
B. 130 m^2
C. 200 m^2
D. 260 m^2

11. Su Lyn uses 120 g of flour, 3 eggs and 20 ml of milk to make one chocolate cake.
She wants to make a lot of cakes for the school market day.
She has plenty of eggs and flour but only has 2 litres of milk.
How much flour will she need to make all of the cakes that she can?

A. 2 kg B. 4 kg C. 6 kg D. 12 kg

12. What is the perimeter of the polygon shown?

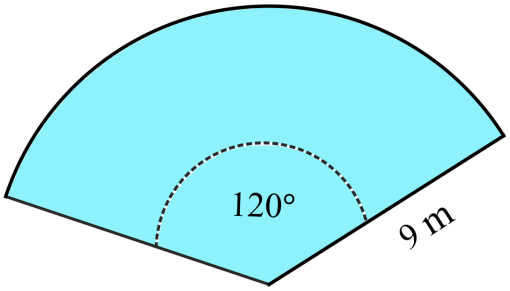


A. 147 m
B. 159 m
C. 161 m
D. 165 m

13. A sheet of artist's paper has an area of 0.8 m^2.
It is to be cut into pieces which have an area of 500 square centimetres.
Assuming there is no wastage, how many pieces could be cut from the sheet?

A. 8 B. 16 C. 32 D. 400

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



A. $18\pi\ m^2$
B. $27\pi\ m^2$
C. $54\pi\ m^2$
D. $81\pi\ m^2$

15. The Earths pre-history is denoted in Eras as shown in the table below.

Era	Time frame
Cenozoic	66 million years ago to present day
Mesozoic	252.17 to 66 million years ago
Paleozoic	541 to 252.17 million years ago
Neoproterozoic	1,000 to 541 million years ago
Mesoproterozoic	1,600 to 1,000 million years ago
Paleoproterozoic	2,500 to 1,600 million years ago
Neoarchean	2,800 to 2,500 million years ago
Mesoarchean	3,200 to 2,800 million years ago
Paleoarchean	3,600 to 3,200 million years ago
Eoarchean	4,000 to 3,600 million years ago

How long did the Paleoproterozoic Era last?

A. 9×10^5 years B. 9×10^6 years
C. 9×10^8 years D. 9×10^{10} years

High School Mathematics Test 2015

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 ⬭

Year 9 **Basic Measurement** Non Calculator

Section 1 Short Answer Section

ANSWERS

No.	WORKING	ANSWER
1.	Width is 8.5 cm or 85 mm.	8.5 cm or 85 mm
2.	7:50 + 55 minutes = 8:00 +45 minutes = 8:45 pm	8:45 pm
3.	$P = 2 \times (15 + 25) = 80$ m	80 m
4.	Counting gives 28.5 cm^2	28.5 cm^2
5.	Area $= \frac{1}{2} \times 24 \times 35 = 420$ m^2	420 m^2
6.	6:33 to 6:55 =27+14 = 22 minutes	41 minutes
7.	If she was 12 min late she arrived at 5:52 Time from 5:52 to 6:44 = 8 min + 44 min = 52 min	52 minutes
8.	Area Block A = $200 \times 100 = 20\,000$ m^2 = 2 hA so 1 hectare = $10\,000$ m^2 Area Block B = $200 \times 250 = 50\,000$ m^2 = 5 hA	5 hectares
9.	Area $= \frac{1}{2}xy = \frac{1}{2} \times 18 \times 25$ $= 225$ cm^2	225 cm^2
10.	6.2×10^7 km = 62 000 000 km.	62 000 000 km
11.	30 min per 500 g = $\frac{30}{5}$ = 6 minutes per 100 g. Mass is 2.4 kg = 2400 g = 24 lots of 100 g. Cooking time = 6 $min \times 24 = 144$ minutes. = 2 hours and 24 minutes	2 hours and 24 minutes

12.	There are 8 intervals of the same length as BC. There are 4 intervals of the same length as AB. Perimeter $= 8 \times 12 + 4 \times AB = 132$ $96 + 4AB = 132$ $4AB = 132 - 96 = 36$ $AB = 36 \div 4 = 9$ cm	9 cm
13.	240 millenia $=$ 240 000 years $= 2.4 \times 10^5$ years	2.4×10^5 years
14.	$\text{Area} = \frac{h}{2}(a + b)$ $\frac{x}{2}(13 + 17) = 450 \text{ cm}^2$ $\frac{x}{2} \times 30 = 450$ $\frac{x}{2} = \frac{450}{30} = 15$ $x = 15 \times 2 = 30$	$x = 30$
15.	Area of circle $= \pi \times 12^2$ $= 144\pi$ Area of $\frac{3}{4}$ circle $= \frac{144\pi}{4} \times 3$ $= 36\pi \times 3 = 108\pi$ Area rectangle $= 12 \times 24 = 288$ Area shaded shape $= 288 + 108\pi \text{ cm}^2$	$288 + 108\pi \text{ cm}^2$

Year 9 *Basic Measurement* Calculator Allowed

Section 2 Multiple Choice Section

ANSWERS

No.	WORKING	ANSWER
1.	6500 ml = 6500 ÷ 1000 = 6.5 litres	B
2.	A quarter past 8 = 20:15 Time from 18:45 to 20:15 = 1 hour + 2 × 15 n = 1 hour and 30 minutes = an hour an a half	C
3.	Area = 6 × 8 + 5 × 7 = 48 + 35 = 83 m^2	D
4.	4 290 000 000 = 4.29×10^9	A
5.	Area = bh = 15 × 24 = 360 m^2	C
6.	Total weight = 1.5 × 800 + 50 = 1200 + 50 = 1250 kg = 1.25 tonnes	A
7.	Time on clock = 9:30 Wake at 9:30 + 8:30 = 9:30 + 2:30 + 6:00 = 6: 00 am Arrive at the bus at 6:00 +1:20 = 7: 20 am	A
8.	P = 20 + 30 + 8 + 10 + 12 + 20 = 100 m = 2 × (20 + 30) = 100 m	D
9.	C = π × diameter = π × 30 = 30π m	B
10.	Area = base × perpendicular height = 20 × 10 = 200 m^2	C
11.	She uses 20 ml of milk for each and has 2 L = 2000 ml. Number of cakes = 2000 ÷ 20 = 100 Amount of flour needed = 100 × 120 = 12000 g = 12 kg of flour	D

12.	$P = 45 + 14 \times 3 + 12 \times 2 + 18 \times 2$ $= 45 + 42 + 24 + 36$ $= 147$ m	A
13.	$1\ m^2 = 100 \times 100\text{cm} = 10\,000\ \text{cm}^2$ $0.8\ m^2 = 10000 \times 0.8 = 8000\ \text{cm}^2$ $\text{Number of pieces} = \frac{8000}{500} = 16 \text{ pieces}$	B
14.	$A = \frac{1}{3} \times \pi \times 9^2$ $= 27\pi\ \text{cm}^2$	B
15.	Paleoproterozoic lasted from 2 500 million years to 1 600 million years. Time difference = 2 500 000 000 – 1 600 000 000 = 900 000 000 years $= 9 \times 10^8$ years	C

High School Mathematics Test 2015

Multiple Choice Answer Sheet

Basic Measurement

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 ○