Name: Solutions Teacher: File

SYDNEY TECHNICAL HIGH SCHOOL

YEAR 7

MATHEMATICS

COMMON TEST

MAY 2014

Time Allowed:	**70 Minutes**	
Total Marks:	**85 Marks**	
Part A:	Questions 1-25 (Multiple Choice)	(25 Marks)
	Allow approximately 20 minutes	
Part B:	Questions 26-30	(60 Marks)
	Allow approximately 50 minutes	

General Instructions:

- There is a multiple choice answer sheet attached for Questions 1-25. Circle the correct response.
- All answers to questions 26-30 **must** be written on the question sheet with **complete** and **organised** setting out and working.
- Marks will not be given if required working is not shown.
- Marks are indicated for each question but may be changed.
- Use blue or black pen only.
- Calculators are **NOT** allowed.

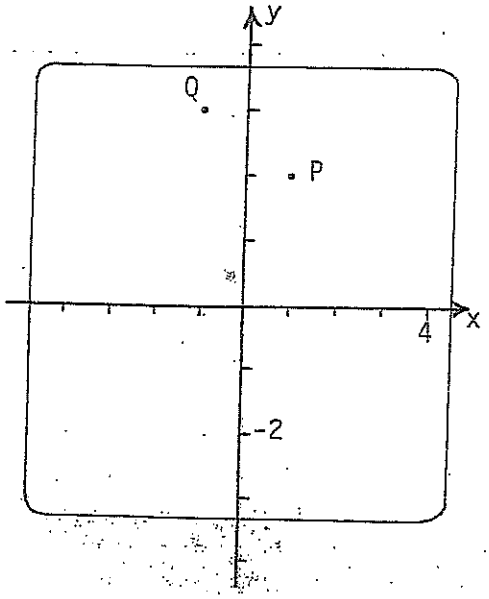
PART A Q1–25 (answers on answer sheet provided)

1. 85 541 rounded off to the nearest thousand is

(A) 85 000 (B) 85 500 (C) 86 000 (D) 90 000

2. Which of the following expressions has the greatest value ?

A. $7(5 + 1)$ B. $6 + 3 \times 5$ C. $\frac{180}{3 \times 2}$ D. $7 \times 8 - 9 \times 2$

3. 

Holes are to be drilled in a metal plate at positions P and Q.

The positions of the holes are given by

A. P(2, 1) Q(-1, 3)

B. P(1, 2) Q(3, -1)

C. P(2, 1) Q(3, -1)

D. P(1, 2) Q(-1, 3)

4. Write in numerals "two hundred and three thousand"

A. 200 300 B. 203 000 C. 230 000 D. 2 003 000

5. Which of these numbers is the smallest?

(A) 0·8 (B) 0·68 (C) 0·608 (D) 0·086

6. $a^3 =$

(A) $a+3$ (B) $a \times 3$ (C) $a+a+a$ (D) $a \times a \times a$

7.

The following maximum temperatures were recorded in 4 cities on the same day.

Montreal	-20°C	Chicago	-6°C
Kuala Lumpur	23°C	San Francisco	4°C

The difference in temperature between the warmest and the coldest city is

A. 3°C B. 19°C C. 29°C D. 43°C

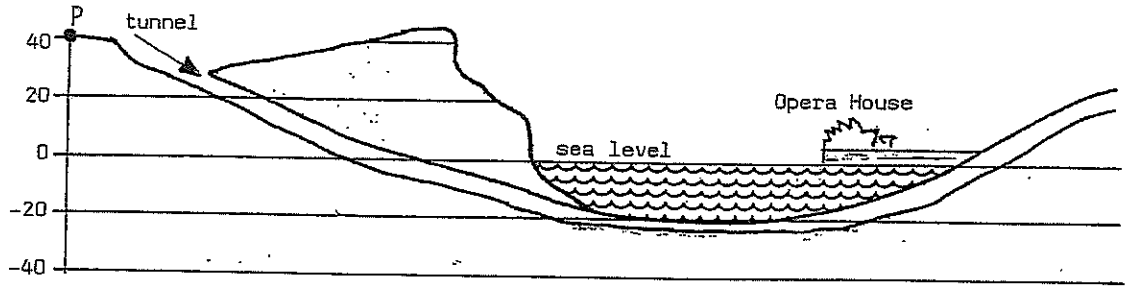
8.

$6+12 \div (5-2)$ is the same as

(A) $\frac{6+12}{5}-2$ (B) $6+\frac{12}{5}-2$ (C) $\frac{6+12}{5-2}$ (D) $6+\frac{12}{5-2}$

9.

Sydney Harbour tunnel is one solution to some of Sydney's traffic problems. The diagram below shows the path of the tunnel under the harbour.



The vertical drop in height from point P to the lowest part of the tunnel is closest to

A. 15 m B. 25 m C. 40 m D. 65 m

10.

Car	Tank Capacity (Litres)	Distance per Litre (Kilometres)
Honda	48 L	14 km
Fiat	40 L	16 km
Volvo	60 L	11 km
Ford	80 L	7 km

Which car would go furthest on a full tank ?

A. Honda B. Fiat C. Volvo D. Ford

11. Job X pays $12 936 yearly. Job Y pays $1148 monthly.
The difference in the yearly salaries between Job X and Job Y is

A. $14 084 B. $11 788 C. $840 D. $70

12. Which of these numbers is between 0·08 and 0·3?

(A) 0·4 (B) 0·009 (C) 0·12 (D) 0·057

13. Generaltown High School has 120 students in Year 10. There are 10 more boys than girls.

How many boys are there?

(A) 55 (B) 60 (C) 65 (D) 70

14.

Name of bushwalk	*Distance* (km)	*Caves*	*Waterfalls*
Bluegum	4·5	no	yes
Ferngully	5	yes	yes
Lyrebird	6·5	yes	no
Rainforest	7	yes	yes

Steven wants to take a bushwalk which includes caves and waterfalls, and is more than 6 km in length.

Which bushwalk should he take?

(A) Bluegum (B) Ferngully (C) Lyrebird (D) Rainforest

15.

CHRISTMAS BONUS		
Years of employment	*Permanent*	*Casual*
Less than 5	$100	$60
5 to 9	$140	$90
10 to 14	$170	$110
15 or more	$190	$120

A company is giving Christmas bonuses to its employees. Mr Williams has been a permanent employee for 20 years. Mrs Williams has been a casual employee for 7 years.

The total bonus they will receive is

(A) $210 (B) $260 (C) $280 (D) $330

16.

	Friday	Saturday	Sunday	Monday
High	5°C	1°C	−2°C	4°C
Low	2°C	−3°C	−4°C	−1°C

Calculate the differences between the high and low temperatures.
On which day was the difference greatest?

(A) Friday (B) Saturday (C) Sunday (D) Monday

17.

The balance in Ted's account before and after he went to the bank is shown below:

	BALANCE
BEFORE	−$20.00
AFTER	$30.00

What did Ted do at the bank?

(A) Deposited $10 (B) Withdrew $10 (C) Deposited $50 (D) Withdrew $50

18

FOOD	Calcium content per serving (mg)
Milk	310
Cheese	300
Ice Cream	140

Fiona needs ***at least*** 1100 mg of calcium each day.

Use the table on the left to find which of the combinations of servings below will give her enough calcium.

Number of servings

	Milk	Cheese	Ice Cream
(A)	2	0	2
(B)	1	1	3
(C)	2	1	1
(D)	2	2	0

19.

The total cost of train tickets for two adults and two children is $4·80. A child's ticket is half the cost of an adult's ticket.

Calculate the cost of a child's ticket.

(A) 80 cents (B) $1·20 (C) $1·60 (D) $2·40

20.

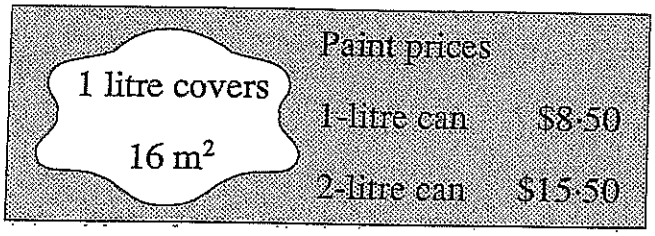
The daily charges of AUSSIE RENT-A-CAR are shown below

	1-6 days	7 or more days
Cost per day	$44	$38

Mia hires a car for 6 days.
Jan hires a car for 7 days.
Jan's bill is more than Mia's by

A. $2 B. $6 C. $38 D. $44

21.



John wants to put one coat of paint on a wall of area 45 m^2.

The lowest amount that the paint could cost is

(A) $15·50 (B) $24·00 (C) $25·50 (D) $31·00

22.

Distances by Air

	Alice Springs	Brisbane
Brisbane	2246 km	
Cairns	1460 km	1392 km

Gabby flies directly from Brisbane to Alice Springs.

Charles flies from Brisbane to Cairns and then from Cairns to Alice Springs.

How much ***further*** than Gabby does Charles fly?

(A) 606 km (B) 2246 km

(C) 2314 km (D) 2852 km

23

The cost of water is calculated using the table below

AMOUNT USED	COST
300 kilolitres or less	$20
301 to 500 kilolitres	$20 plus 38¢ for each kL over 300 kL
over 500 kilolitres	$96 plus 47¢ for each kL over 500 kL

The cost for 460 kL is

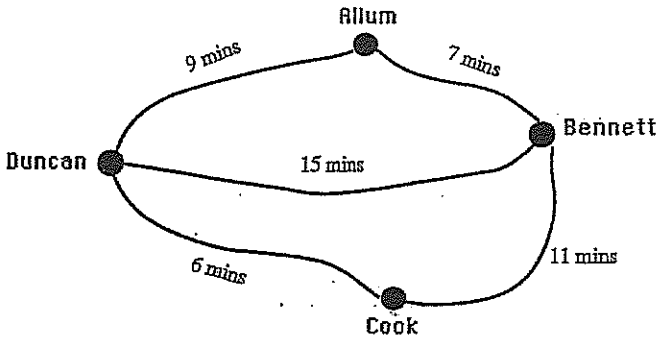
A. $60.80 B. $80.80 C. $174.80 D. $194.80

24.

Jane is 2 cm taller than Bill, Peter is 6 cm taller than Bill. Jane is 160 cm tall.
How tall is Peter?

(A) 152 cm (B) 156 cm (C) 164 cm (D) 168 cm

25.



Four towns of similar size are joined by five roads. The time to drive between towns is shown on the diagram.

In which town would it be best to place emergency services?

(A) Allum (B) Bennett

(C) Cook (D) Duncan

MATHEMATICS DEPARTMENT

YEAR 7, MAY 2014

Name: _____ Class: _____

Circle the letter that represents the answer of your choice

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
16.	A	B	C	D
17.	A	B	C	D
18.	A	B	C	D
19.	A	B	C	D
20.	A	B	C	D
21.	A	B	C	D
22.	A	B	C	D
23.	A	B	C	D
24.	A	B	C	D
25.	A	B	C	D

Name: _____ Teacher: _____

SYDNEY TECHNICAL HIGH SCHOOL

YEAR 7

MATHEMATICS

COMMON TEST

MAY 2014

Part B:

- Show all working in spaces provided.
- Calculators are **NOT** to be used.

Part A	Multiple Choice	/25
Part B	Question 26 – Whole Numbers	/12
	Question 27 – Number Theory	/12
	Question 28 – Algebra	/12
	Question 29 – Directed Number	/12
	Question 30 - Decimals	/12
	Total:	/85

Part B: **Show all working in spaced provided.**

Question 26: **Operations with Whole Numbers** **12 marks**

---

a)

$$\begin{array}{r} 145 \\ 78+ \\ \hline 4986 \\ \hline \end{array}$$

2

b)

$$\begin{array}{r} 279 \\ 86\times \\ \hline \\ \\ \hline \end{array}$$

2

c) Subtract 2936 from 5273.

2

d) $2973 \div 5$

2

e) $29\overline{)5976}$

2

f) Use a pattern to help find the sum of the first 100 counting numbers.

2

Question 27: Number Theory **12 marks**

a) Write the first 5 prime numbers.

_____ 1

b) Find the basic numeral for
$8 - (13 - 8 - 2) \times 2$

_____ 1

c) Insert grouping symbols to make this statement true.

$10 \times 3 - 16 - 2 = 16$ 1

d) i) Write all the factors of 36 and 100.

Factors 36 _____

_____

Factors 100 _____

_____

_____ 2

ii) What is the highest common factor of 36 and 100.

_____ 1

e) Write 360 as a product of its prime factors.

_____

_____

_____

_____ 1

f) What is the divisibility test for 3. Give a suitable example using a 3 digit number.

_____

_____

_____

_____ 1

g) $\sqrt[3]{8}$

_____ 1

h) If $441 = 3^2 \times 7^2$ find $\sqrt{441}$.

_____ 1

i) Find $\sqrt[3]{3^6 \times 5^{15}}$ in index form.

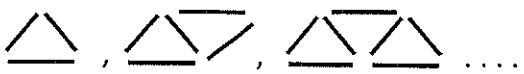
_____ 1

j) Write the first 3 multiples of 7.

_____ 1

Question 28: Algebra **12 marks**

a) i) Complete the table below where t is the number of triangles and m is the number of matches.



t	1	2	3	4	15	20
m						

2

ii) Write a rule for the above table.

m = _____ 1

b) i) Write a rule for the table below.

x	1	2	3	4	6	
y	5	7	9	11		19

y = _____ 1

ii) Fill in the missing squares. 2

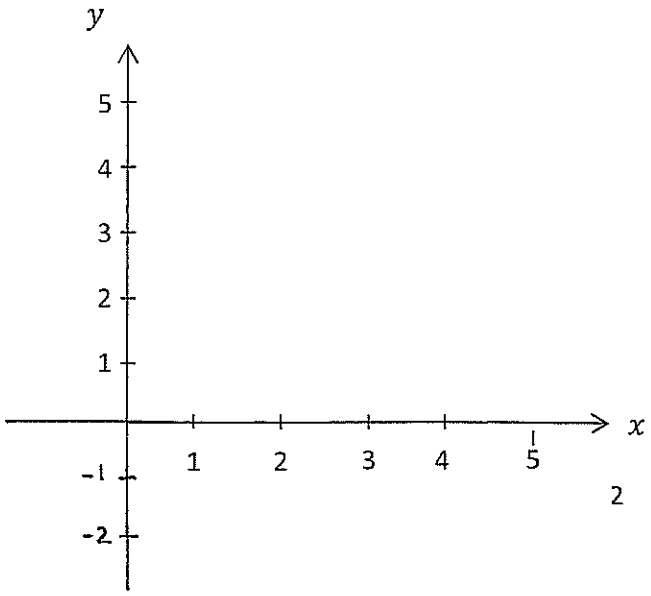
c) i) Complete the table given the rule

$y = 2 \times x - 1$

x	0	1	2	3
y				

2

ii) Plot the points from your completed table on the number plane below.



2

d) If $x = 3$ find the value of y if $y = x^2$.

_____ 1

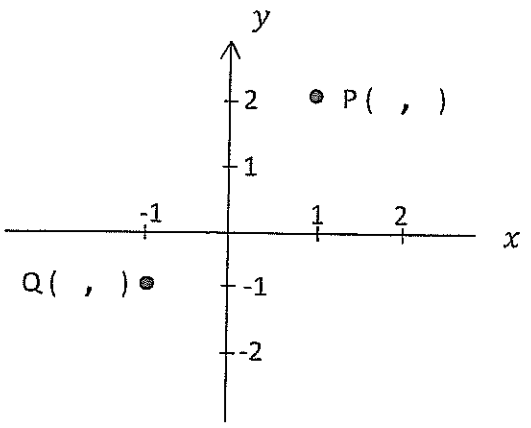
e) If m = 12 find the value of y if

$y = \frac{3 \times m}{4}$

_____ 1

Question 29: Directed Numbers **12 marks**

a) Find the co-ordinates of P and Q.



2

b) $^{-}5 - 8 =$ _____ 1

c) $^{-}4 - {}^{-}3 =$ _____ 1

d) $(^{-}6)^3 =$ _____ 1

d) $^{-}15 \div {}^{-}5 =$ _____ 1

f) $^{-}4 + 8 \div 4 =$ _____ 1

g) $\dfrac{^{-}9 + 12}{2 - 3} =$ _____ 1

h) Complete "The point (0,0) is called the _____ " 1

i) True or False

$(^{-}6 - 7) - 8 = {}^{-}6 + (^{-}7 - 8)$

_____ 1

j) Find the value of x if

$^{-}8 \times x = 304$

_____ 1

k) Two numbers have a product of 12 and a sum of $^{-}7$. What are the numbers?

_____

_____

_____

_____

_____ 1

Question 30 **Decimals** **12 Marks**

Show all working and setting out

---

a) 97.3 – 8.95

1

b) 26.08 x 6

1

c) 2.08 x 100 = 1

d) 2.03 ÷ 100 = 1

e) (0.9 x 6) + (0.9 x 4) =

1

f) A photocopier takes 0.8 seconds to produce a copy. How long would it take to produce 1000 copies in minutes and seconds.

1

g) 15.6 x 1.7

1

h) 62.1 ÷ 6

1

i) 0.344 ÷ 0.08

1

j) $(0.2)^3$

1

k) Convert $6\frac{7}{8}$ to a decimal.

1

l) Write $\frac{7}{9}$ as a decimal correct to 2 decimal places.

1

Name: Solutions Teacher: _____

SYDNEY TECHNICAL HIGH SCHOOL

YEAR 7

MATHEMATICS

COMMON TEST

MAY 2014

Part B:

- Show all working in spaces provided.
- Calculators are **NOT** to be used.

Part A	Multiple Choice	/25
Part B	Question 26 – Whole Numbers	/12
	Question 27 – Number Theory	/12
	Question 28 – Algebra	/12
	Question 29 – Directed Number	/12
	Question 30 - Decimals	/12
	Total:	/85

Part B: **Show all working in spaced provided.**

Question 26: **Operations with Whole Numbers** **12 marks**

a)

$$\begin{array}{r} 145 \\ 78+ \\ \hline 4986 \\ \hline 5209 \end{array}$$

2

b)

$$\begin{array}{r} 279 \\ 86\times \\ \hline 1674 \\ 22320 \\ \hline 23994 \end{array}$$

2

c) Subtract 2936 from 5273.

2337

2

d) $2973 \div 5$

$594\frac{3}{5}$

2

e)

$29\overline{)5976}$

$206\frac{2}{29}$

2

f) Use a pattern to help find the sum of the first 100 counting numbers.

$= 1+2+3+4\ldots+98+99+100$

$= 100+(1+99)+(2+98)+(3+97)+$

$\ldots+(49+51)+50$

$= 50\times(100)+50$

$= 5050$

2

Question 27: Number Theory — 12 marks

a) Write the first 5 prime numbers.

2, 3, 5, 7, 11 — 1

b) Find the basic numeral for $8-(13-8-2)\times 2$

2 — 1

c) Insert grouping symbols to make this statement true.

$10 \times 3 - (16 - 2) = 16$ — 1

d) i) Write all the factors of 36 and 100.

Factors 36: 1, 2, 3, 4, 6, 9, 12, 18, 36

Factor 100: 1 2 4 5 10 20 25 50 100 — 2

ii) What is the highest common factor of 36 and 100.

4 — 1

e) Write 360 as a product of its prime factors.

2	360
2	180
2	90
3	45
3	15
	5

$2^3 \times 3^2 \times 5$ — 1

f) What is the divisibility test for 3. Give a suitable example using a 3 digit number.

added digits give number divisible by 3

eg: → — 1

g) $\sqrt[3]{8}$

2 — 1

h) If $441 = 3^2 \times 7^2$ find $\sqrt{441}$.

3×7 — 1

i) Find $\sqrt[3]{3^6 \times 5^{15}}$ in index form.

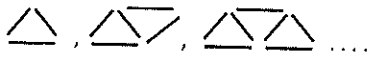
$3^2 \times 5^5$ — 1

j) Write the first 3 multiples of 7.

7, 14, 21 — 1

Question 28: Algebra — 12 marks

a) i) Complete the table below where t is the number of triangles and m is the number of matches.



t	1	2	3	4	15	20
m	3	5	7	9	31	41

2

ii) Write a rule for the above table.

$m =$ $2t + 1$ = $2 \times t + 1$ etc — 1

b) i) Write a rule for the table below.

x	1	2	3	4	6	8
y	5	7	9	11	15	19

$y =$ $2x + 3$ = $2 \times x + 3$ etc — 1

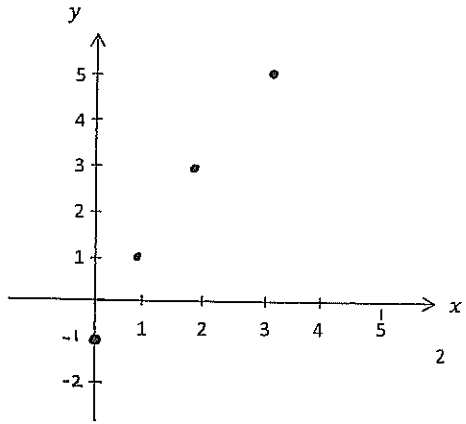
ii) Fill in the missing squares. 2

c) i) Complete the table given the rule $y = 2 \times x - 1$

x	0	1	2	3
y	−1	1	3	5

2

ii) Plot the points from your completed table on the number plane below.



2

d) If $x = 3$ find the value of y if $y = x^2$.

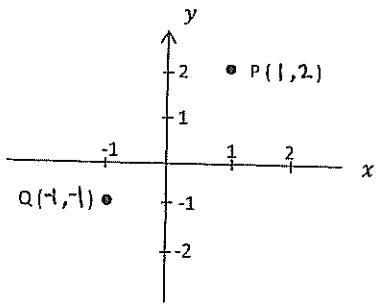
9 — 1

e) If $m = 12$ find the value of y if $y = \frac{3 \times m}{4}$

9 — 1

Question 29: Directed Numbers **12 marks**

a) Find the co-ordinates of P and Q.



P(1,2) Q(-1,-1) 2

b) $^{-}5 - 8 =$ -13 1

c) $^{-}4 - {}^{-}3 =$ -1 1

d) $(^{-}6)^3 =$ -216 1

d) $^{-}15 \div {}^{-}5 =$ 3 1

f) $^{-}4 \div 8 \div 4 =$ -2 1

g) $\frac{^{-}9 + 12}{2 - 3} =$ -3 1

h) Complete "The point (0,0) is called the origin" 1

i) True or False

$(^{-}6 - 7) - 8 = {}^{-}6 + (^{-}7 - 8)$

$-21 = -21$

true 1

j) Find the value of x if

$^{-}8 \times x = 304$

$x = -38$ 1

k) Two numbers have a product of 12 and a sum of $^{-}7$. What are the numbers?

-4 and -3 1

Question 30 Decimals **12 Marks**

Show all working and setting out

a) 97.3 – 8.95

88.35 1

b) 26.08 x 6

156.48 1

c) 2.08 x 100 = 208 1

d) 2.03 ÷ 100 = .0203 1

e) (0.9 x 6) + (0.9 x 4) =

9 1

f) A photocopier takes 0.8 seconds to produce a copy. How long would it take to produce 1000 copies in minutes and seconds.

800 seconds

$\frac{800}{60}$ 13min 20sec 1

g) 15.6 x 1.7

26.52 1

h) 62.1 ÷ 6

10.35 1

i) 0.344 ÷ 0.08

4.3 1

j) $(0.2)^3$

.008 1

k) Convert $6\frac{7}{8}$ to a decimal.

6.875 1

l) Write $\frac{7}{9}$ as a decimal correct to 2 decimal places.

0.78 1

Solutions YR 7 M|C

MAY 2014

MATHEMATICS DEPARTMENT

Name: _____ Class: _____

Circle the letter that represents the answer of your choice

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
16.	A	B	C	**D**
17.	A	B	**C**	D
18.	A	B	C	**D**
19.	**A**	B	C	D
20.	**A**	B	C	D
21.	A	**B**	C	D
22.	**A**	B	C	D
23.	A	**B**	C	D
24.	A	B	**C**	D
25.	A	B	C	**D**