DULWICH COLLEGE SHANGHAI

# IGCSE – Module 1 TEST – 70 Minutes 54 Marks

Name: _____ Date_____Teacher_____

1.

During one week in April, in Quebec, the daily minimum temperatures were

−5°C, −1°C, 3°C, 2°C, −2°C, 0°C, 6°C.

Write down

**(a)** the lowest of these temperatures,

*Answer(a)* ..... °C [1]

**(b)** the range of these temperatures.

*Answer(b)* ..... °C [1]

2.

Write the numbers in order of size with the **smallest** first.

$\sqrt{10}$ 3.14 $\frac{22}{7}$ $\pi$

*Answer* ..... < ..... < ..... < ..... [2]

3.

$\sqrt{23}$ 48% 4.80 $\frac{53}{11}$

Write the numbers in order of size with the **largest** first.

*Answer* ..... > ..... > ..... > ..... [2]

4.

$p$ is the largest prime number between 50 and 100.
$q$ is the smallest prime number between 50 and 100.

Calculate the value of $p - q$.

*Answer* ..... [2]

5.

Write the number 1045.2781 correct to

**(a)** 2 decimal places,

*Answer(a)* ..... [1]

**(b)** 2 significant figures.

*Answer(b)* ..... [1]

6.

Calculate the value of $5(6 \times 10^3 + 400)$, giving your answer in standard form.

*Answer* ..... [2]

7.

A light on a computer comes on for 26700 microseconds.

One microsecond is $10^{-6}$ seconds.

Work out the length of time, in seconds, that the light is on

**(a)** in standard form,

*Answer(a)* ..... s [1]

**(b)** as a decimal.

*Answer(b)* ..... s [1]

8.

The length of each side of an equilateral triangle is 74 mm, correct to the nearest millimetre.

Calculate the smallest possible perimeter of the triangle.

*Answer* ..... mm [2]

9.

A fence is made from 32 identical pieces of wood, each of length 2 metres correct to the nearest centimetre.

Calculate the lower bound for the total length of the wood used to make this fence.

Write down your full calculator display.

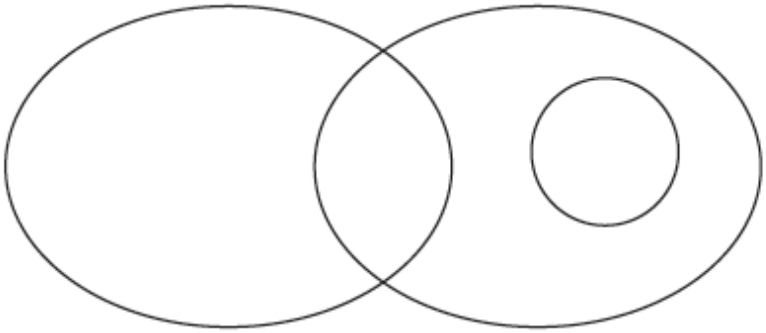
*Answer* ..... m [3]

10

.

$Q = \{2, 4, 6, 8, 10\}$ and $R = \{5, 10, 15, 20\}$.
$15 \in P$, $n(P) = 1$ and $P \cap Q = \emptyset$.

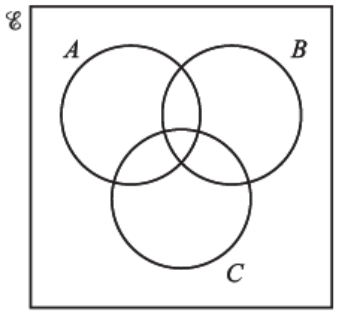
Label each set and complete the Venn diagram to show this information.



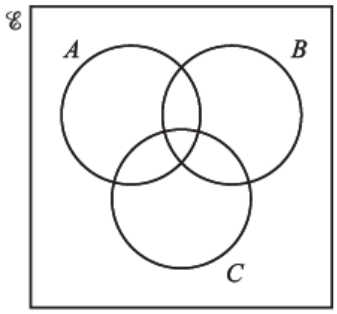
[3]

11.

**Shade the required regions in the Venn diagrams below.**




$(A \cup B)' \cap C$



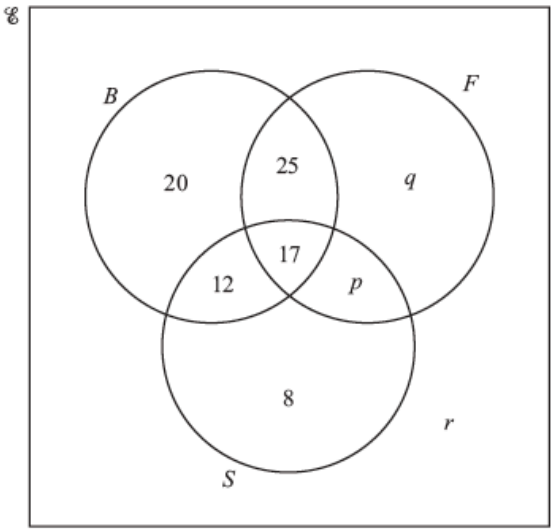

$(A \cap B) \cup C$

[2]

12

In a survey, 100 students are asked if they like basketball ($B$), football ($F$) and swimming ($S$).

The Venn diagram shows the results.




42 students like swimming.

40 students like exactly one sport.

**(a)** Find the values of $p$, $q$ and $r$. [3]

**(b)** How many students like

**(i)** all three sports, [1]

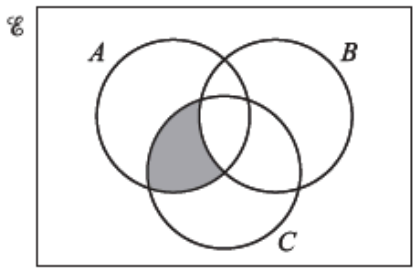
**(ii)** basketball and swimming but not football? [1]

**(c)** Find

**(i)** $n(B')$, [1]

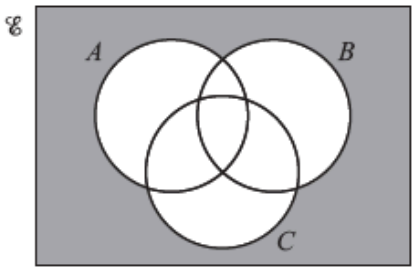
**(ii)** $n((B \cup F) \cap S')$. [1]

13.




The shaded area in the diagram shows the set $(A \cap C) \cap B'$.

Write down the set shown by the shaded area in each diagram below.

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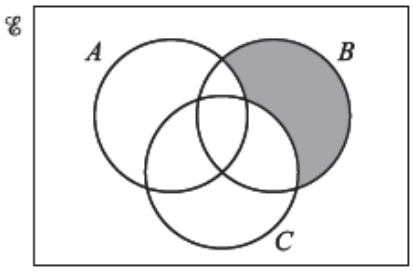



.....

[2]

14.

**(a)** The formula for the $n$th term of the sequence

$$1,\ 5,\ 14,\ 30,\ 55,\ 91,\ \ldots \quad \text{is} \quad \frac{n(n+1)(2n+1)}{6}.$$

Find the 20th term.

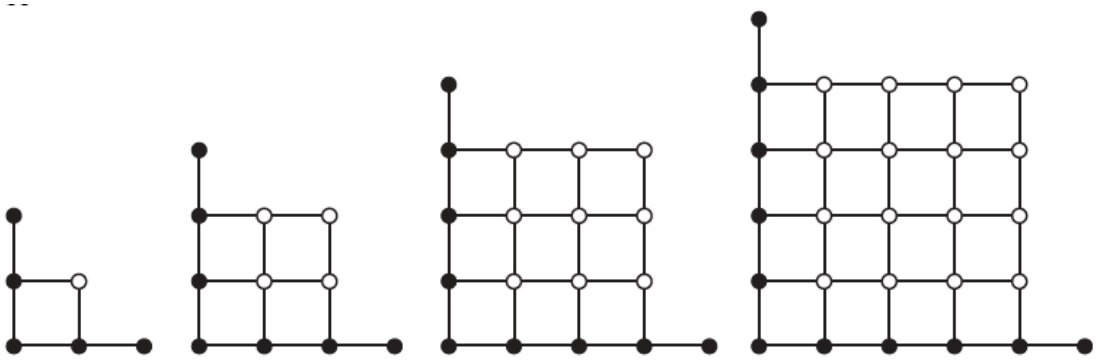
*Answer(a)* ..... [1]

**(b)** The $n$th term of the sequence 10, 17, 26, 37, 50, ... is $(n+2)^2+1$.

Write down the formula for the $n$th term of the sequence 17, 26, 37, 50, 65, ...

*Answer(b)* ..... [1]

15.



| **Diagram 1** | **Diagram 2** | **Diagram 3** | **Diagram 4** |
|---|---|---|---|
| 1 white dot | 4 white dots | 9 white dots | 16 white dots |
| 5 black dots | 7 black dots | 9 black dots | 11 black dots |
| 6 lines | 14 lines | 26 lines | 42 lines |

The four diagrams above are the first four of a pattern.

**(a)** Diagram 5 has been started below.
Complete this diagram and write down the information about the numbers of dots and lines.

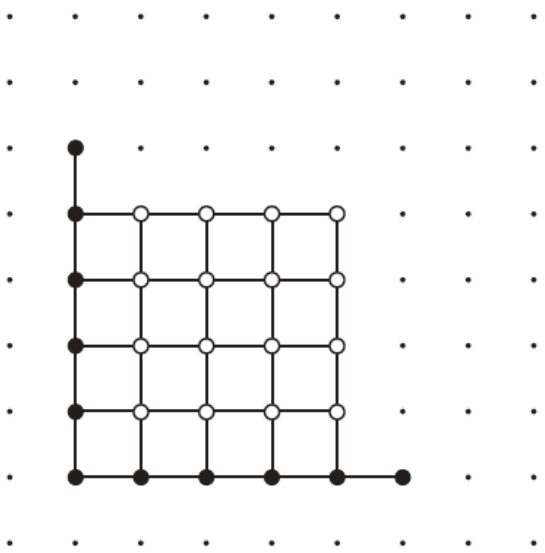


**Diagram 5**

..... white dots

..... black dots

..... lines

[4]

**(b)** Complete the information about the number of dots and lines in Diagram 8.

*Answer(b)* ..... white dots

..... black dots

..... lines [3]

**(c)** Complete the information about the number of dots in Diagram $n$.
Give your answers in terms of $n$.

*Answer(c)* ..... white dots

..... black dots [2]

**(d)** The number of lines in diagram $n$ is $k(n^2 + n + 1)$.

Find

**(i)** the value of $k$,

*Answer(d)*(i) $k =$ ..... [1]

**(ii)** the number of lines in Diagram 100.

*Answer(d)*(ii) ..... [1]

16.

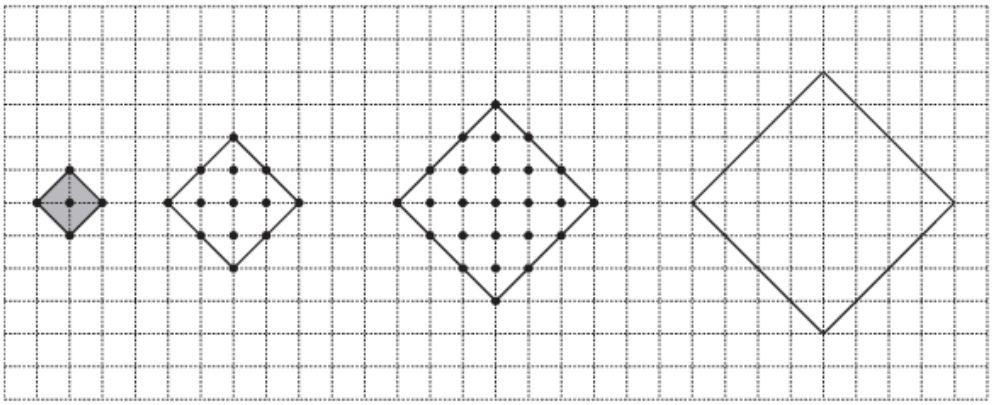


Diagram 1 Diagram 2 Diagram 3 Diagram 4

The diagrams show squares and dots on a grid.

Some dots are on the sides of each square and other dots are inside each square.

The area of the square (shaded) in Diagram 1 is 1 unit$^2$.

**(a)** Complete Diagram 4 by marking all the dots. [1]

**(b)** Complete the columns in the table below for Diagrams 4, 5 and $n$.

| Diagram | 1 | 2 | 3 | 4 | 5 | ------- | $n$ |
|---|---|---|---|---|---|---|---|
| Number of units of area | 1 | 4 | 9 | | | ------- | |
| Number of dots inside the square | 1 | 5 | 13 | | | ------- | $(n-1)^2+n^2$ |
| Number of dots on the sides of the square | 4 | 8 | 12 | | | ------- | |
| Total number of dots | 5 | 13 | 25 | | | ------- | |

[7]