Set language and notation

Question Paper 2

Level	IGCSE
Subject	Maths
Exam Board	Edexcel
Topic	Number and Algebra
Sub Topic	Set language and notation
Booklet	Question Paper 2

Time Allowed: **52 minutes**

Score: **/43**

Percentage: **/100**

Grade Boundaries:

9	8	7	6	5	4	3	2	1
>90%	80%	70%	60%	50%	40%	30%	20%	10%

1 $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$
  $A = \{1, 3, 5, 7\}$
  $B = \{2, 4, 6, 8\}$

(a) Explain why $A \cap B = \varnothing$

....

....

(1)

$x \in \mathscr{E}$ and $x \notin A \cup B$

(b) Write down the value of x.

$x =$ ....

(1)

$A \cap C = \{3, 7\}$, $B \cap C = \{8\}$ and $A \cup B \cup C = \mathscr{E}$

(c) List all the members of C.

....

(2)

(Total for Question 1 is 4 marks)

2
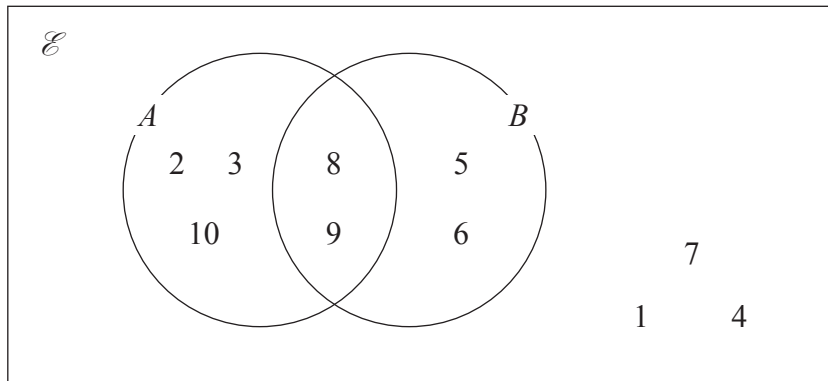
The Venn diagram shows all of the elements in sets A, B and $\mathscr{E}$.

(a) Write down the elements in A'

....

(1)

(b) Find n$(A \cap B)'$

....

(1)

(c) Find the elements in $(A \cap B) \cup (A \cup B)'$

....

(1)

$A \cap C = \varnothing$
$B \cup C = \{5, 6, 7, 8, 9\}$
$n(C) = 3$

(d) Write down the elements in C.

....

(1)

(Total for Question 2 is 4 marks)

3 $\mathscr{E} = \{$positive whole numbers less than 19$\}$
$A = \{$odd numbers$\}$
$B = \{$multiples of 5$\}$
$C = \{$multiples of 4$\}$

(a) List the members of the set

(i) $A \cap B$

....

(ii) $B \cup C$

....

(2)

$D = \{$prime numbers$\}$

(b) Is it true that $B \cap D = \varnothing$?

Tick ($\checkmark$) the appropriate box.

Yes	No
☐	☐

Explain your answer.

....

(1)

(Total for Question 3 is 3 marks)

4 $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

$A = \{\text{even numbers}\}$

$B = \{\text{multiples of 3}\}$

(a) List the members of set B.

....

(1)

(b) Find $A \cup B$

....

(1)

(c) Find $A \cap B$

....

(1)

x is a member of $\mathscr{E}$

$x \in B$

$x \notin A$

(d) What are the possible values of x?

....

(2)

(Total for Question 4 is 5 marks)

5 *A* and *B* are two sets.

$$n(\mathscr{E}) = 36$$
$$n(B) = 21$$
$$n(A \cap B) = 8$$
$$n(A') = 18$$

(a) Complete the Venn diagram to show the **number of elements** in each region of the Venn diagram.
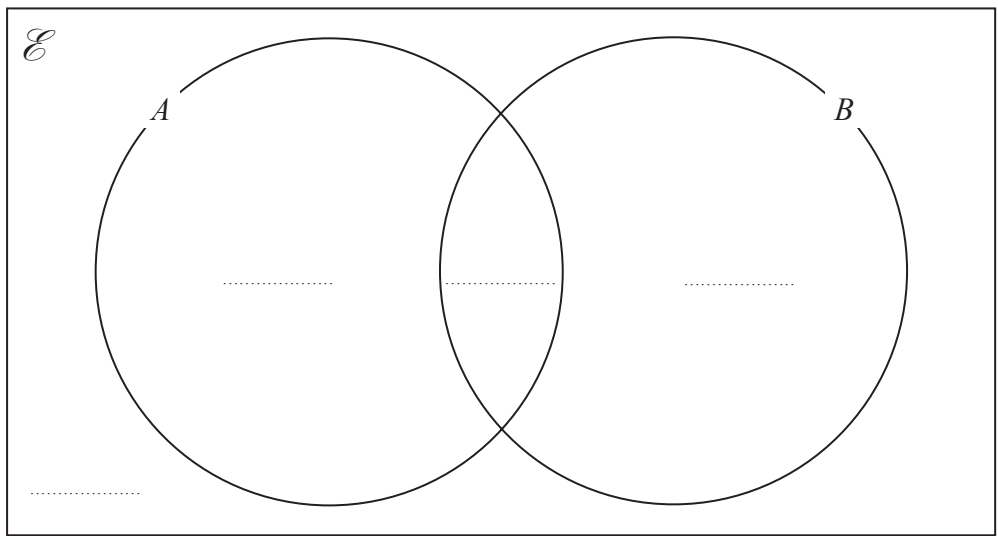
(3)

(b) Find $n(A \cup B)$

....

(1)

(c) Find $n(A \cap B')$

....

(1)

(Total for Question 5 is 5 marks)

6 $S = \{c, h, i, n, a\}$ $V = \{i, t, a, l, y\}$

List the elements of the set

(i) $S \cap V$

....

(ii) $S \cup V$

....

(Total for Question 6 is 2 marks)

7 $\mathscr{E} = \{1,$
$A = \{1, 2, 3, 4, 5, 6\}$
$B = \{odd\ numbers\}$

(a) List the members of $A \cup B$

....

(1)

C is a set such that $A \cap C = \{4, 5\}$
The set C has 4 members.

(b) List the members of one possible set C

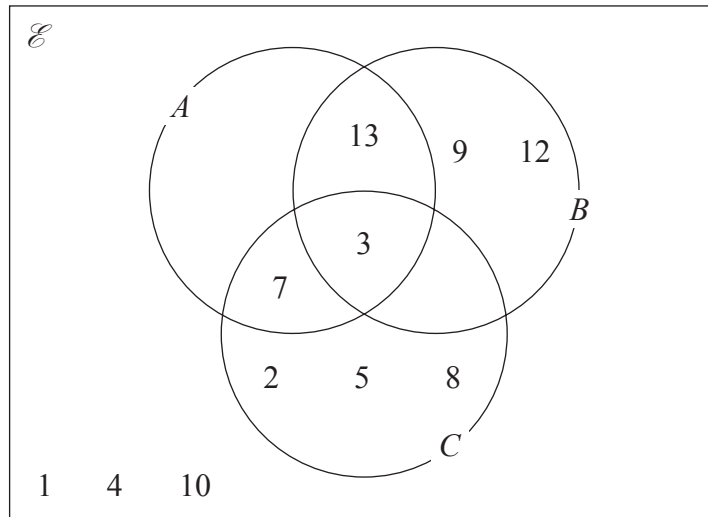...

(2)

(Total for Question 7 is 3 marks)

8 $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13\}$
$A = \{3, 7, 11, 13\}$
$B = \{3, 6, 9, 12, 13\}$
$C = \{2, 3, 5, 6, 7, 8\}$

(a) Complete the Venn diagram.

(1)

(b) List the members of the set $B' \cap C$

....

(1)

(c) List the members of the set $(A \cup C)' \cap B$

....

(1)

(d) Find n$(A' \cap B')$

....

(1)

(Total for Question 8 is 4 marks)

9 $\mathscr{E}$ = {whole numbers}

   A = {factors of 100}

   B = {multiples of 5}

   List the members of the set $A \cap B$

(Total for Question 9 is 2 marks)

10 $A = \{2, 4, 6, 8, 10, 12, 14\}$
$B = \{1, 3, 5, 7, 9, 11, 13\}$
$C = \{3, 6, 9, 12\}$

(a) List the members of the set

(i) $A \cap C$

....

(ii) $A \cup C$

....

(2)

(b) Explain why $A \cap B = \emptyset$

....

(1)

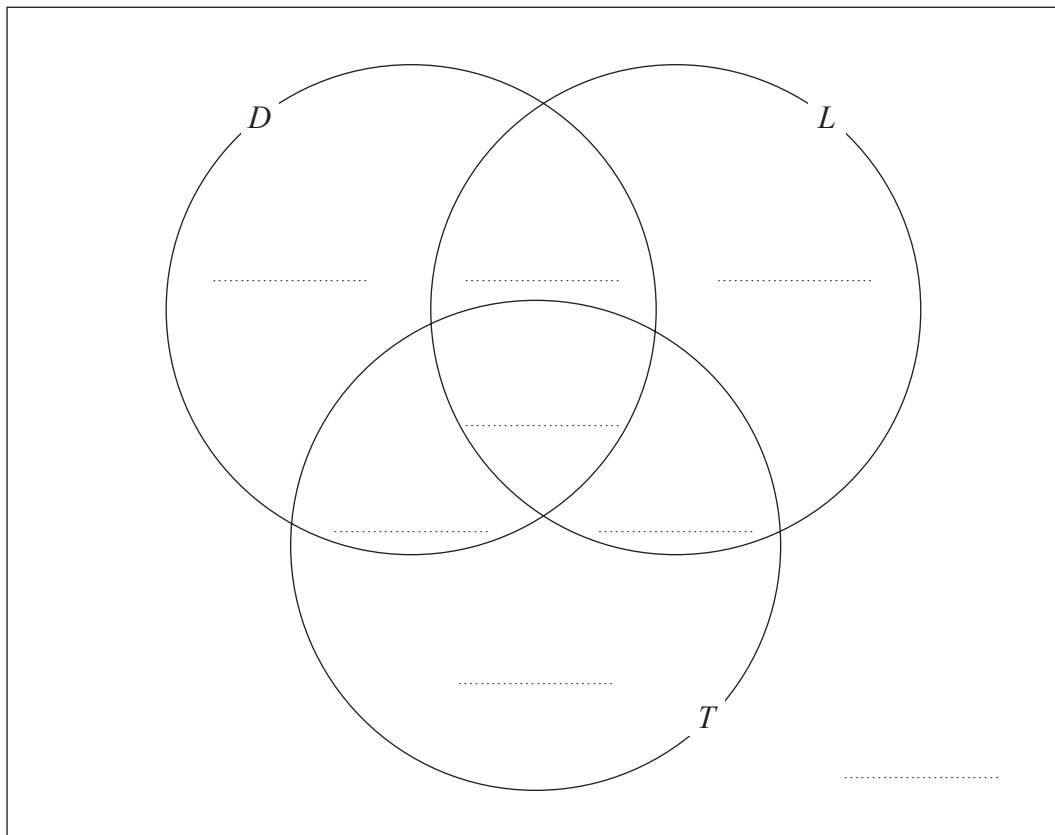**(Total for Question 10 is 3**

marks)

11 Each student in a group of 32 students was asked the following question.

"Do you have a desktop computer (*D*), a laptop (*L*) or a tablet (*T*)?"

Their answers showed that

19 students have a desktop computer
17 students have a laptop
16 students have a tablet
9 students have both a desktop computer and a laptop
11 students have both a desktop computer and a tablet
7 students have both a laptop and a tablet
5 students have all three.

(a) Using this information, complete the Venn diagram to show the number of students in each appropriate subset.
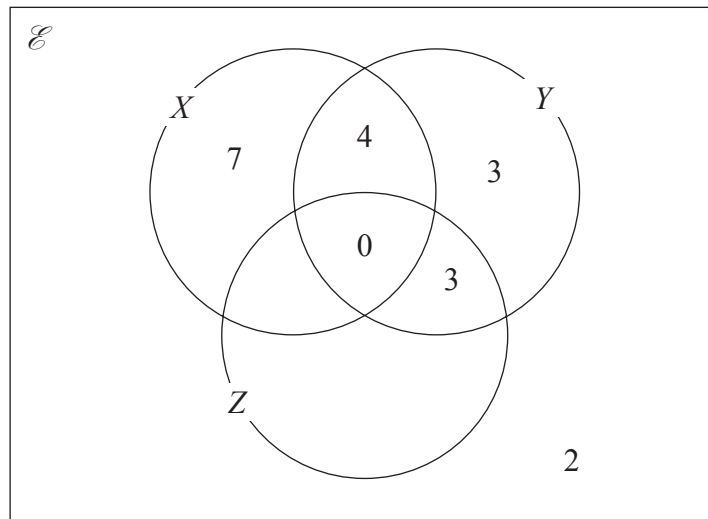
(3)

One of the students with both a desktop computer and a laptop is chosen at random.

(b) Find the probability that this student also has a tablet.

....

(1)

(Total for Question 11 is 4 marks)

12 The Venn diagram shows a universal set $\mathscr{E}$ and three sets X, Y and Z.

The numbers shown represent **numbers** of elements.

n(X') = 14
n(Z) = 14

(a) Complete the Venn diagram.

(2)

(b) Find the value of

  (i) n($X \cup Z$)

  ....

  (ii) n($X \cap Y'$)

  ....

(2)

(Total for Question 12 is 4 marks)