

# Set Notation & Venn Diagrams

## Question Paper

Course	Edexcel IGCSE Maths
Section	1. Numbers & the Number System
Topic	Set Notation & Venn Diagrams
Difficulty	Medium

**Time allowed:** 60  
**Score:** /46  
**Percentage:** /100

### Question 1

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

$A = \{\text{factors of 8}\}$

$B = \{\text{factors of 20}\}$

List the members of the set  $A \cup B$ .

[2 marks]

### Question 2a

$\xi = \{\text{Students in year 12}\}$

$G = \{\text{Students who study German}\}$

$F = \{\text{Students who study French}\}$

$M = \{\text{Students who study Maths}\}$

$G \cap M = \emptyset$

Use this information to write a statement about the students who study German in Year 12.

[1 mark]

### Question 2b

Preety is a student in Year 12,

$\text{Preety} \notin F$ .

Use this information to write a statement about Preety.

[1 mark]

**Question 2c**

$$A = \{2, 4, 6, 8, 10\}$$

$$A \cap B = \{2, 4\}$$

$$A \cup B = \{1, 2, 3, 4, 6, 8, 10\}$$

List all the members of set  $B$ .

[2 marks]

**Question 3a**

$$A = \{s, u, p, e, r\}$$

$$B = \{c, o, m, p, u, t, e, r\}$$

List the members of the set

i)

$$A \cap B,$$

[1]

ii)

$$A \cup B.$$

[1]

[2 marks]

**Question 3b**

$$X = \{\text{prime numbers}\}$$

$$Y = \{\text{factors of 12}\}$$

Is it true that  $X \cap Y = \emptyset$ ?

Tick (✓) the appropriate box.

Yes     No

Explain your answer.

[1 mark]

**Question 4**

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$

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

$P = \{\text{prime number}\}$

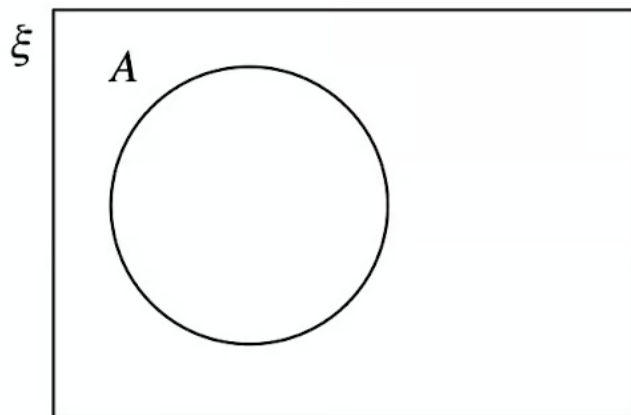
List the members of the set  $A \cap P$ .

[1 mark]

**Question 5a**

$A$ ,  $B$  and  $C$  are three sets.

$A \cap B = \emptyset$  and  $C \subset A$



Complete the Venn diagram to show the sets  $B$  and  $C$ .

[2 marks]

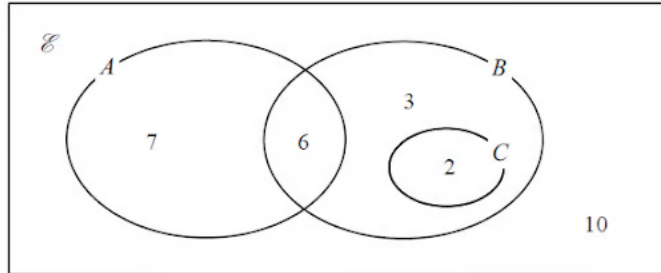
**Question 5b**

On the Venn diagram, shade the region that represents  $A \cap C'$ .

[1 mark]

**Question 6a**

The Venn diagram shows a universal set  $\xi$  and three sets  $A$ ,  $B$  and  $C$ .



7, 6, 3, 2 and 10 represent the **number** of elements in each set.

Find

$$n(A \cup B)$$

[1 mark]

**Question 6b**

$$n(A')$$

[1 mark]

**Question 6c**

$$n(B \cap C')$$

[1 mark]

**Question 6d**

$$n(A' \cup B')$$

[1 mark]

**Question 7**

$\xi = \{\text{whole numbers}\}$

$A = \{\text{factors of } 100\}$

$B = \{\text{multiples of } 5\}$

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

[2 marks]

**Question 8a**

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

$A = \{1, 3, 5, 7\}$

$B = \{2, 4, 6, 8\}$

Explain why  $A \cap B = \emptyset$ .

[1 mark]

**Question 8b**

$x \in \xi$  and  $x \notin A \cup B$ .

Write down the value of  $x$ .

$x = \dots\dots\dots$

[1 mark]

**Question 8c**

$A \cap C = \{3, 7\}$ ,  $B \cap C = \{8\}$  and  $A \cup B \cup C = \xi$ .

List all the members of  $C$ .

[2 marks]

### Question 9a

$\xi = \{\text{positive whole numbers less than } 19\}$

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

$B = \{\text{multiples of } 5\}$

$C = \{\text{multiples of } 4\}$

List the members of the set

i)

$A \cap B'$ ,

ii)

$B \cup C$ .

[2 marks]

### Question 9b

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

Is it true that  $C \cap D = \emptyset$ ?

Tick (✓) the appropriate box.

Yes    No

Explain your answer.

[1 mark]

### Question 10a

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

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

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

List the members of set  $B'$ .

[1 mark]

**Question 10b**

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

[1 mark]

**Question 10c**

$x$  is a member of  $\xi$ ,

$x \in B$ ,

$x \notin A$ .

What are the possible values of  $x$ ?

[2 marks]



**Question 11a**

A and B are two sets.

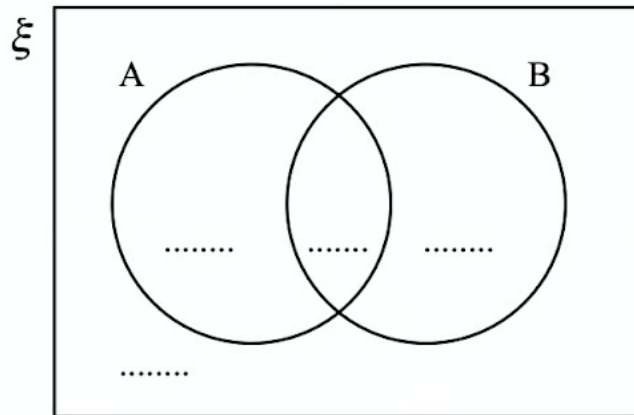
$$n(\xi) = 36$$

$$n(B) = 21$$

$$n(A \cap B) = 8$$

$$n(A') = 18$$

Complete the Venn diagram to show the **number of elements** in each region.



[3 marks]

**Question 11b**

Find

i)

$$n(A \cup B)$$

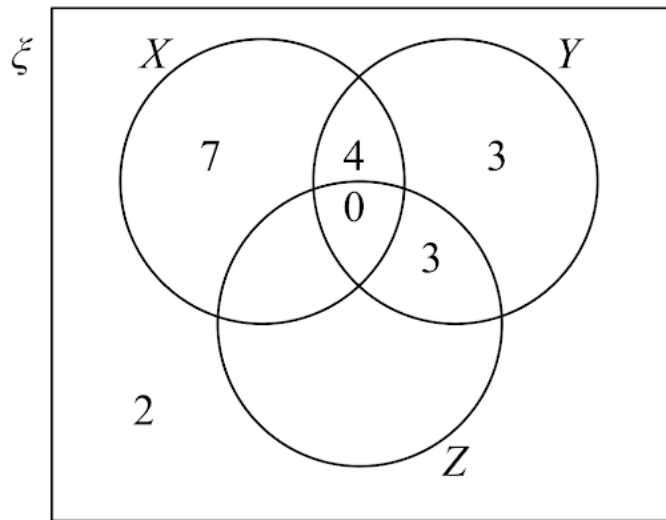
ii)

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

[2 marks]

**Question 12a**

The Venn diagram shows a universal set  $\xi$  and three sets X, Y and Z.



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

$n(X) = 14$

$n(Z) = 14$

Complete the Venn diagram.

[2 marks]

**Question 12b**

Find

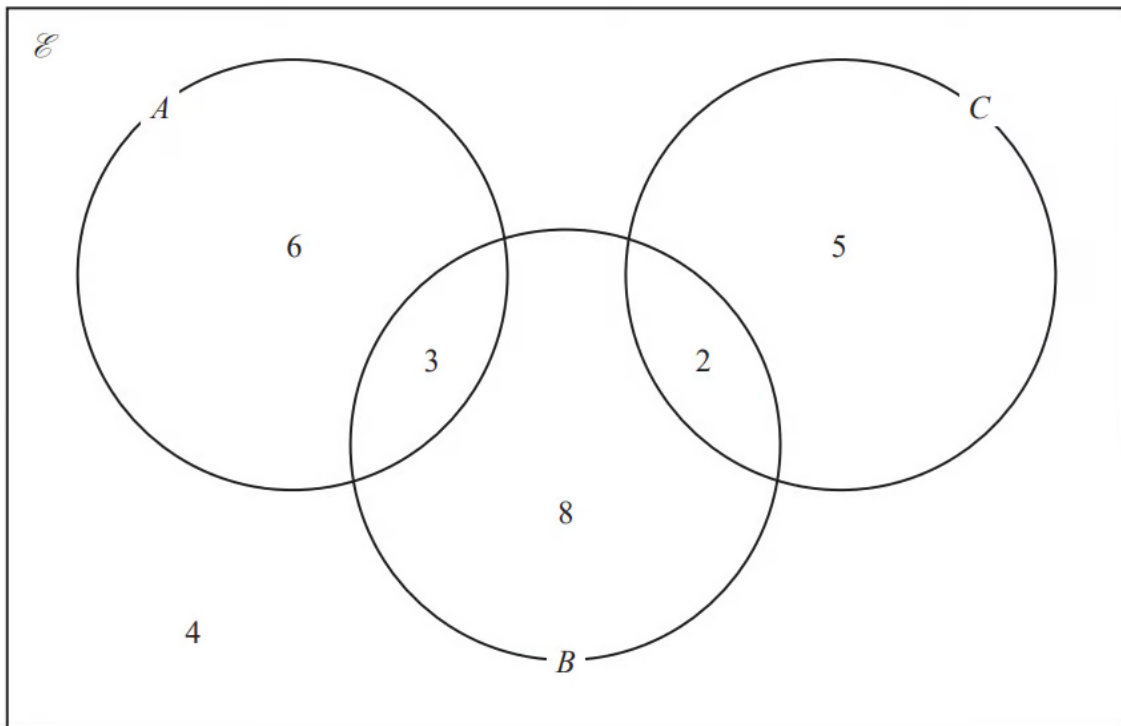
i)  
 $n(X \cup Z)$

ii)  
 $n(X \cap Y)$

[2 marks]

**Question 13a**

The Venn diagram shows a universal set  $\mathcal{E}$  and three sets  $A$ ,  $B$  and  $C$ .



6, 3, 8, 2, 5 and 4 represent the **numbers** of elements.

Find

$$n(A \cup B)$$

[1 mark]

**Question 13b**

$$n(A \cap C)$$

[1 mark]

**Question 13c**

$$n(B \cap C')$$

[1 mark]

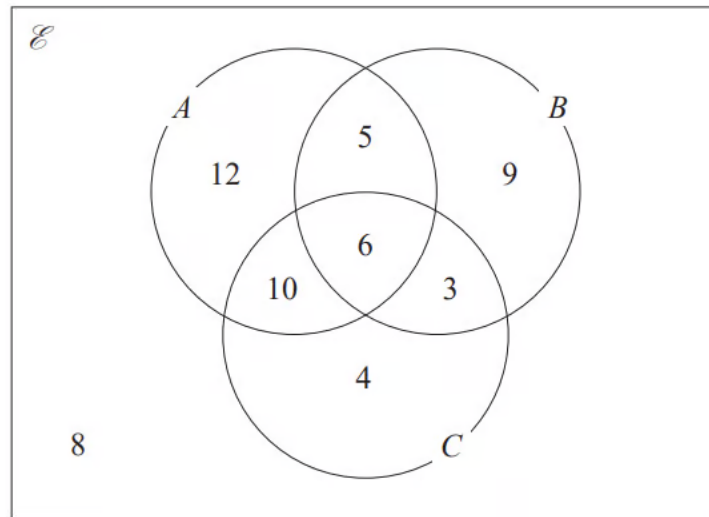
**Question 13d**

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

[1 mark]

**Question 14**

The Venn diagram shows a universal set,  $\mathcal{E}$  and sets  $A$ ,  $B$  and  $C$ .



12, 5, 9, 10, 6, 3, 4 and 8 represent the **numbers** of elements.

Find

i)  
 $n(A \cup B)$  [ ]

ii)  
 $n(A' \cap B')$  [ ]

iii)  
 $n([A \cap B] \cup C)$  [ ]

**[3 marks]**