

# Sets & Venn Diagrams

## Question Paper 1

Level	IGCSE
Subject	Maths (0580)
Exam Board	Cambridge International Examinations (CIE)
Paper Type	Extended
Topic	Number
Sub-Topic	Sets & Venn Diagrams
Booklet	Question Paper 1

**Time Allowed:** 60 minutes

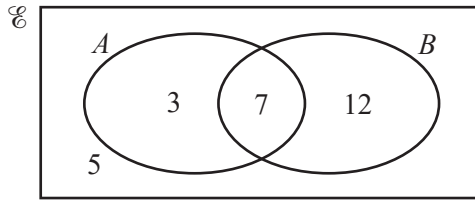
**Score:** /50

**Percentage:** /100

**Grade Boundaries:**

A*	A	B	C	D	E	U
>85%	75%	60%	45%	35%	25%	<25%

1



The Venn diagram shows the numbers of elements in each region.

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

..... [1]

(b) An element is chosen at random.

Find the probability that this element is in set  $B$ .

..... [1]

(c) An element is chosen at random from set  $A$ .

Find the probability that this element is also a member of set  $B$ .

..... [1]

(d) On the Venn diagram, shade the region  $(A \cup B)'$ .

[1]

2 (a)  $\mathcal{U} = \{x: 2 \leq x \leq 16, x \text{ is an integer}\}$   
 $M = \{\text{even numbers}\}$   
 $P = \{\text{prime numbers}\}$

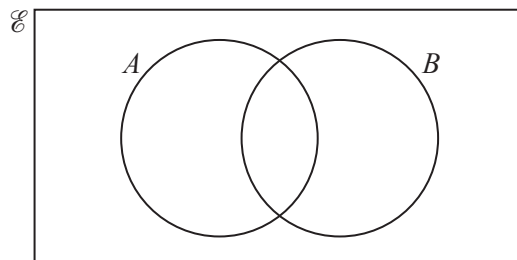
(i) Find  $n(M)$ .

..... [1]

(ii) Write down the set  $(P \cup M)'$ .

$(P \cup M)' = \{\dots\dots\dots\}$  [1]

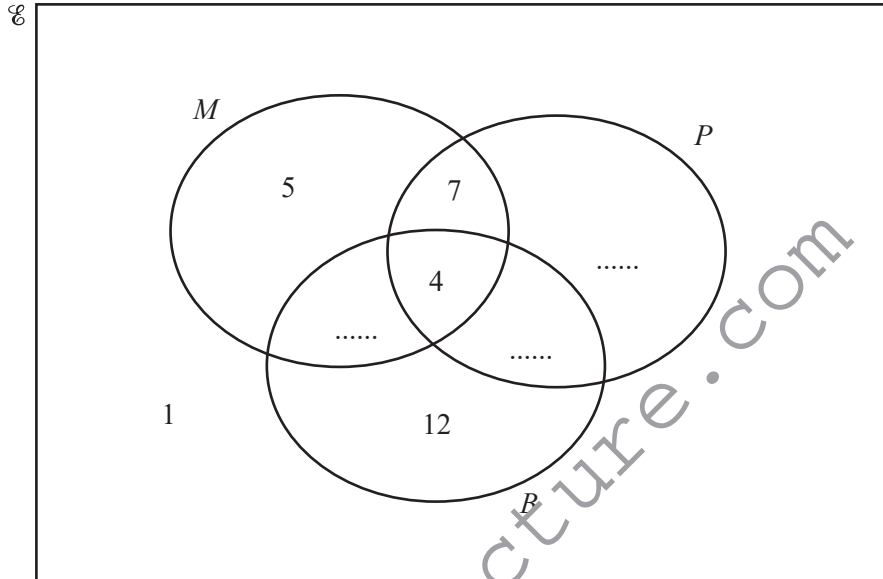
(b) On the Venn diagram, shade  $A \cap B'$ .



3 (a) Davinder asked some people if they ate mangoes, pineapples or bananas last week.

- $M = \{ \text{people who ate mangoes} \}$
- $P = \{ \text{people who ate pineapples} \}$
- $B = \{ \text{people who ate bananas} \}$

The Venn diagram shows some of the information.



19 people said they ate mangoes.  
 6 people said they ate **only** pineapples.  
 18 people said they ate **exactly two** of the three types of fruit.

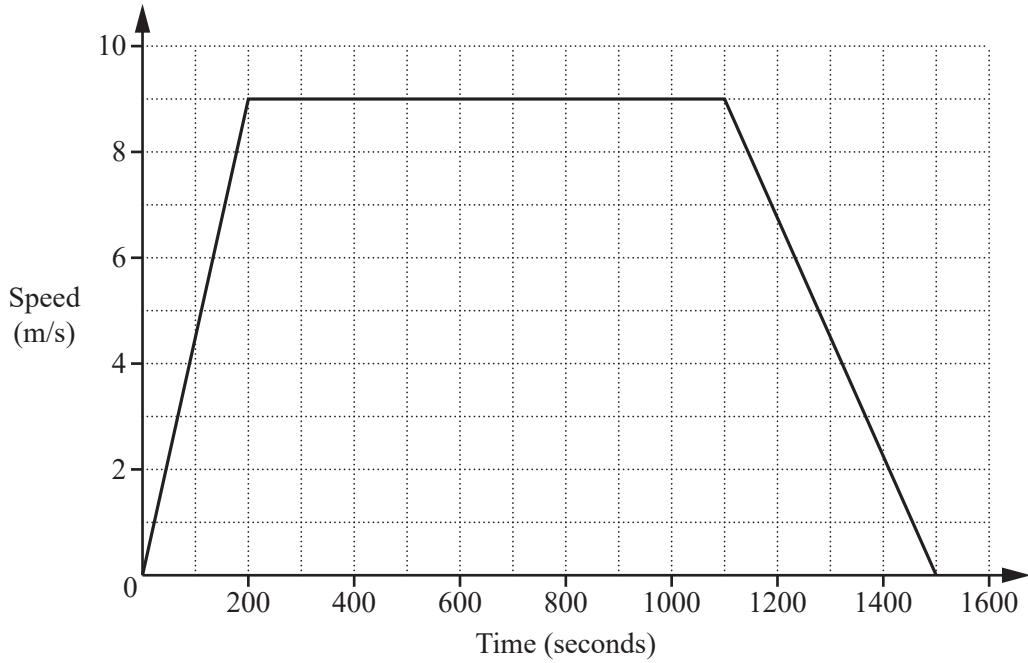
(i) Write the three missing values in the Venn diagram. [3]

(ii) Find the total number of people Davinder asked.  
 ..... [1]

(iii) Find  $n(M \cap P)$ .  
 ..... [1]

(iv) One person is chosen at random from the people who ate mangoes.  
 Write down the probability that this person also ate bananas.  
 ..... [2]

(b) Davinder draws a speed-time graph for his bus journey to the market.



Find

(i) the acceleration of the bus

..... m/s<sup>2</sup> [1]

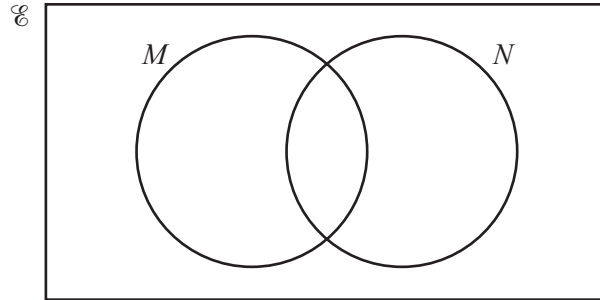
(ii) the total distance travelled by the bus,

..... m [3]

(iii) the average speed of the bus for the whole journey.

4 (a) You may use this Venn diagram to help you answer part (a).

- $\mathcal{E} = \{x: 1 \leq x \leq 12, x \text{ is an integer}\}$
- $M = \{\text{odd numbers}\}$
- $N = \{\text{multiples of 3}\}$



(i) Find  $n(N)$ .

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

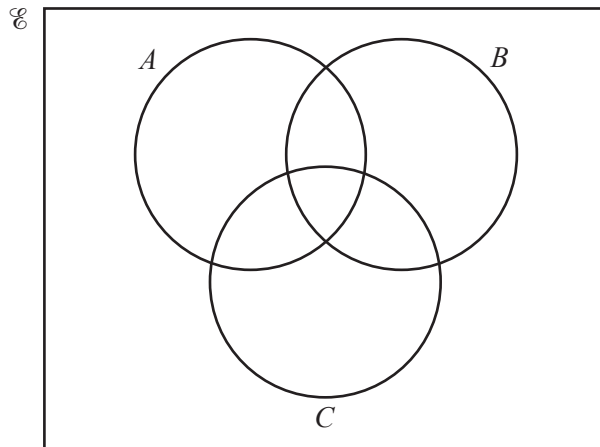
(ii) Write down the set  $M \cap N$ .

Answer(a)(ii)  $M \cap N = \{ \dots \}$  [1]

(iii) Write down a set  $P$  where  $P \subset M$

Answer(a)(iii)  $P = \{ \dots \}$  [1]

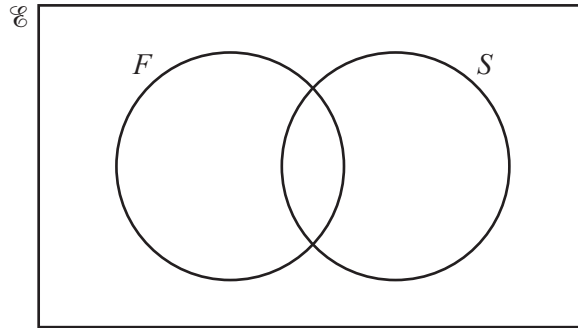
(b) Shade  $(A \cup C) \cap B'$  in the Venn diagram below.



[1]

8

5 (a) In this part, you may use this Venn diagram to help you answer the questions.



In a class of 30 students, 25 study French ( $F$ ), 18 study Spanish ( $S$ ).  
One student does not study French or Spanish.

(i) Find the number of students who study French and Spanish.

Answer(a)(i) ..... [2]

(ii) One of the 30 students is chosen at random.

Find the probability that this student studies French but not Spanish.

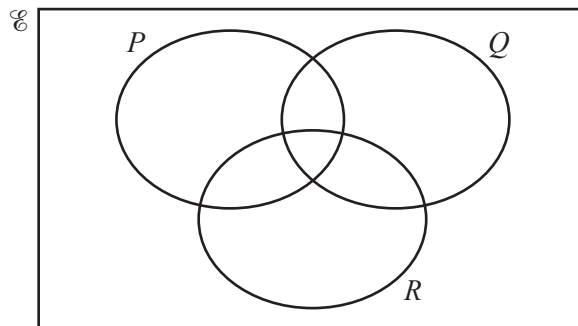
Answer(a)(ii) ..... [1]

(iii) A student who does not study Spanish is chosen at random.

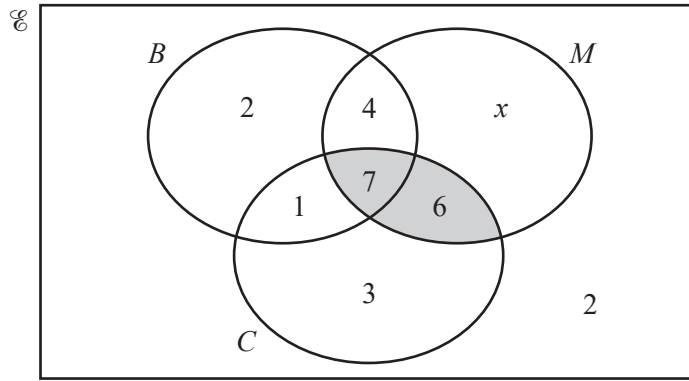
Find the probability that this student studies French.

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

(b)



- 6 30 students were asked if they had a bicycle ( $B$ ), a mobile phone ( $M$ ) and a computer ( $C$ ). The results are shown in the Venn diagram.



- (a) Work out the value of  $x$ .

Answer(a)  $x = \dots\dots\dots$  [1]

- (b) Use set notation to describe the shaded region in the Venn diagram.

Answer(b)  $\dots\dots\dots$  [1]

- (c) Find  $n(C \cap (M \cup B)')$ .

Answer(c)  $\dots\dots\dots$  [1]

- (d) A student is chosen at random.

- (i) Write down the probability that the student is a member of the set  $M'$ .

Answer(d)(i)  $\dots\dots\dots$  [1]

- (ii) Write down the probability that the student has a bicycle.

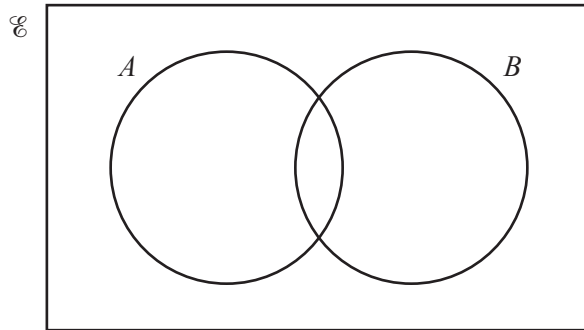
Answer(d)(ii)  $\dots\dots\dots$  [1]

- (e) Two students are chosen at random from the students who have computers.

Find the probability that each of these students has a mobile phone but no bicycle.

Answer(e)  $\dots\dots\dots$  [3]

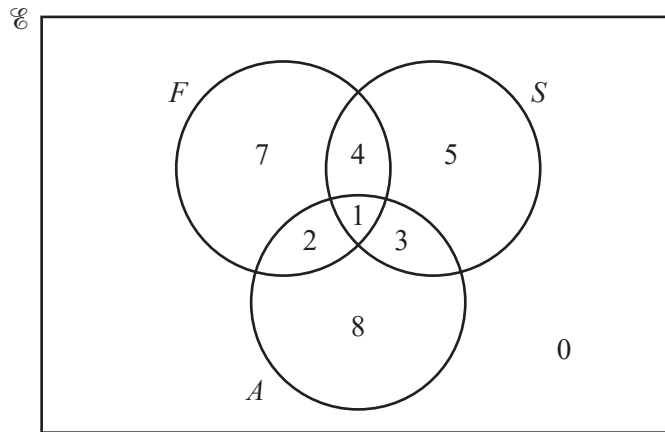
7



In the Venn diagram shade the region  $A \cup B'$ .

[1]

8 The Venn diagram shows the number of students who study French ( $F$ ), Spanish ( $S$ ) and Arabic ( $A$ ).



(a) Find  $n(A \cup (F \cap S))$ .

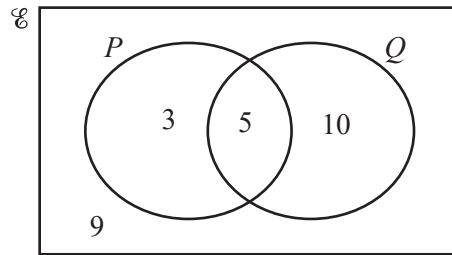
Answer(a) ..... [1]

(b) On the Venn diagram, shade the region  $F' \cap S$ .

[1]



9



The Venn diagram shows the number of elements in each set.

(a) Find  $n(P \cap Q)$ .

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

(b) Complete the statement  $n(\dots\dots\dots) = 17$ .

[1]

www.megalecture.com

10 (a)  $x$  is an integer

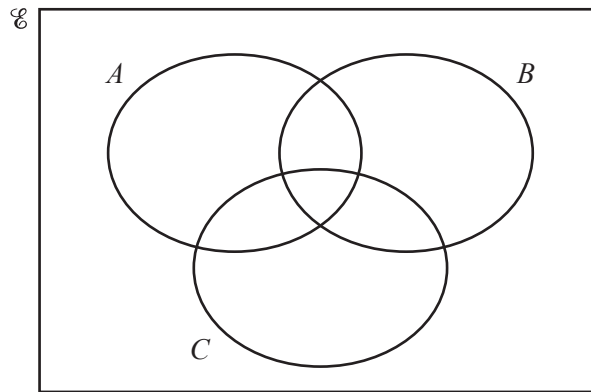
$$\mathcal{E} = \{x: 1 \leq x \leq 10\}$$

$$A = \{x: x \text{ is a factor of } 12\}$$

$$B = \{x: x \text{ is an odd number}\}$$

$$C = \{x: x \text{ is a prime number}\}$$

(i) Complete the Venn diagram to show this information.



[3]

(ii) Use set notation to complete each statement.

$$6 \dots\dots\dots A$$

$$A \cap B \cap C = \dots\dots\dots$$

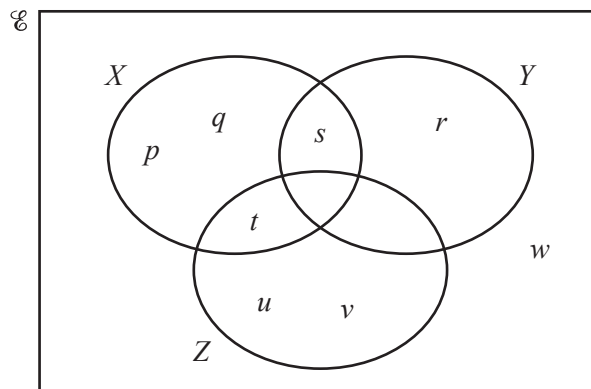
$$A \cap A' = \dots\dots\dots$$

[3]

(iii) Find  $n(B)$ .

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

(b)



(i) Use set notation to complete the statement.

[1]

(ii) Shade  $X \cap Y$

[1]

