

- 6 (a) $\mathcal{E} = \{x : x \text{ is an integer, } 2 \leq x \leq 14\}$
 $A = \{x : x \text{ is a prime number}\}$
 $B = \{x : x \text{ is a multiple of } 3\}$

(i) List the members of $(A \cup B)'$.

Answer [1]

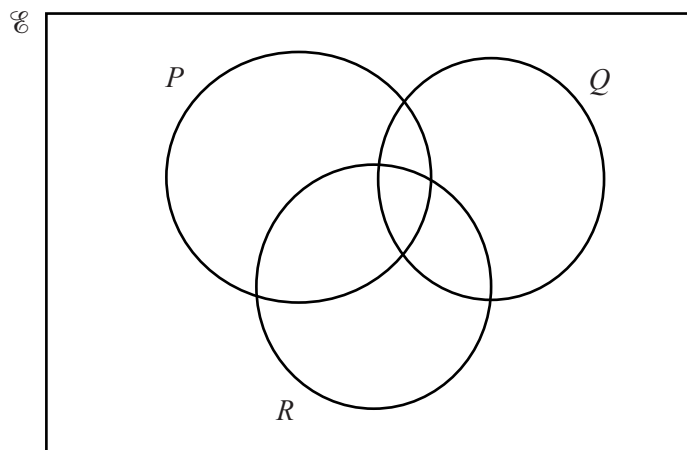
(ii) Find $n(A \cap B)$.

Answer [1]

(iii) Given that $C \subset A$, $n(C) = 3$ and $B \cap C = \emptyset$, list the members of a possible set C .

Answer [1]

(b) On the Venn diagram, shade the set $(P \cup R) \cap Q'$.



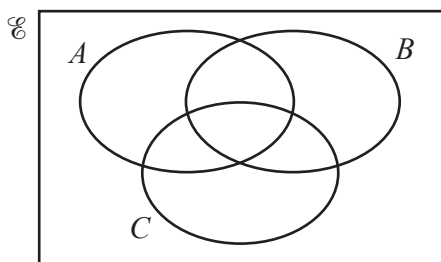
[1]

- (c) A group of 80 people attended a recreation centre on one day.
 Of these people, 48 used the gym
 31 used the swimming pool
 17 used neither the gym nor the swimming pool.

By drawing a Venn diagram, or otherwise, find the number of people who used both the gym and the swimming pool.

Answer [2]

14 (a) In the Venn diagram, shade the region which represents the subset $(A \cap B') \cup C$.



[1]

(b) In a group of 36 students,

- 23 study Spanish,
- 17 study French,
- 4 study neither Spanish nor French.

By drawing a Venn diagram, or otherwise, find the number of students who study both Spanish and French.

Answer [2]

15 Solve the simultaneous equations.

$$3x + y = 9$$

$$2x + 3y = -8$$

Answer $x =$

$y =$ [3]

- 4 (a) $\mathcal{C} = \{x : x \text{ is an integer } 10 \leq x \leq 40\}$
 $P = \{x : x \text{ is a multiple of } 6\}$
 $Q = \{x : x \text{ is a square number}\}$

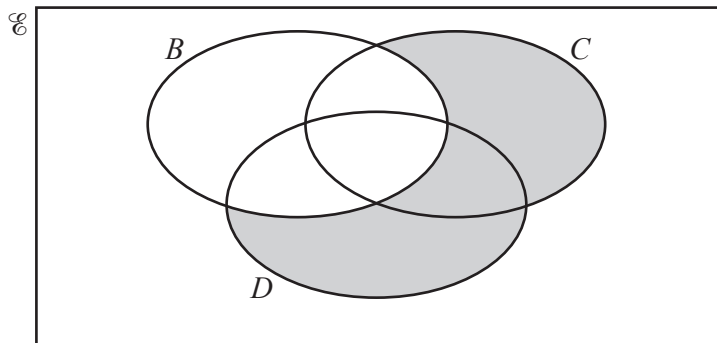
(i) Write down the elements of $P \cup Q$.

..... [1]

(ii) Find $n(P' \cap Q)$.

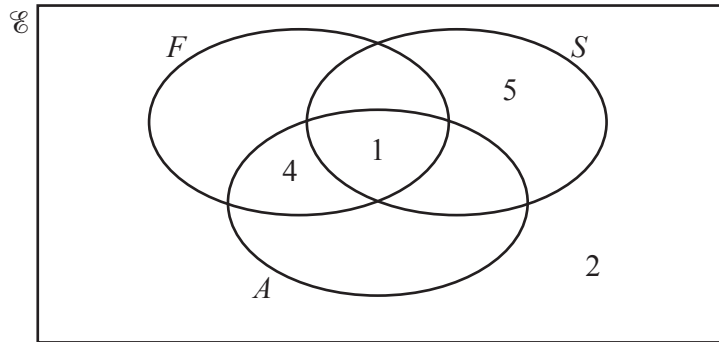
..... [1]

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



..... [1]

- (c) In a college, students can study French (F), Spanish (S) and Arabic (A). A group of 25 students are asked which languages they study. Some of the results are shown in the Venn diagram.



- (i) All students who study both Arabic and Spanish also study French.
 7 students study French only.
 8 students study Arabic.

Use this information to complete the Venn diagram.

[2]

- (ii) Two of the 25 students are selected at random.

Find the probability that they both study Spanish only.

..... [2]

- (iii) Three of the students are selected at random from those who study French.

Find the probability that only one of them also studies Arabic.

..... [3]