

1 $\mathcal{U} = \{x : x \text{ is a natural number } \leq 16\}$

(a) Write down all the square numbers in the universal set, \mathcal{U} .

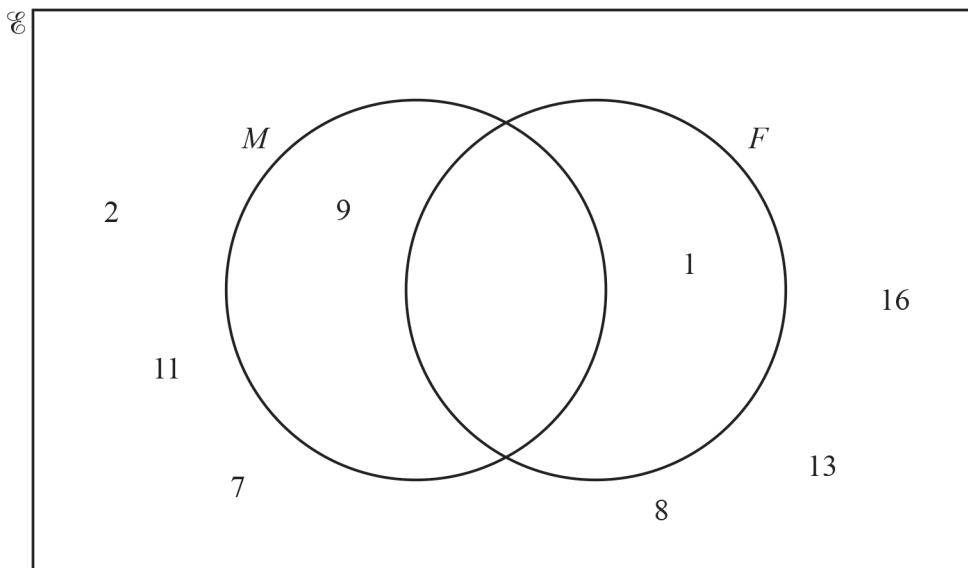
..... [2]

(b) Write down the six prime numbers in the universal set, \mathcal{U} .

.....,,,,, [2]

(c) $M = \{x : x \text{ is a multiple of 3}\}$
 $F = \{x : x \text{ is a factor of 15}\}$

(i) Complete the Venn diagram to show the elements of these sets.



[2]

(ii) Write down all the odd numbers that are not in set M and not in set F .

..... [1]

(iii) Find $n(M \cap F)$.

..... [1]

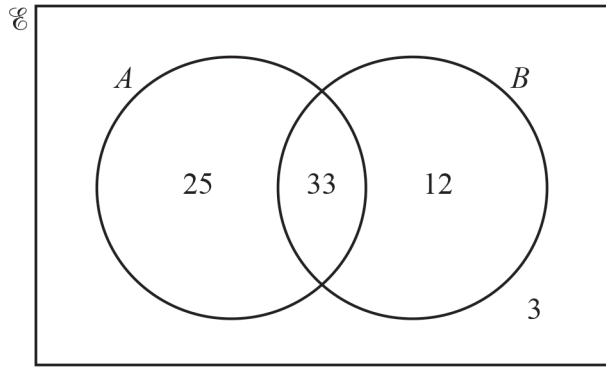
(iv) A number is chosen at random from the universal set, \mathcal{U} .

Find the probability that this number is in set F .

..... [1]

[Total: 9]

2

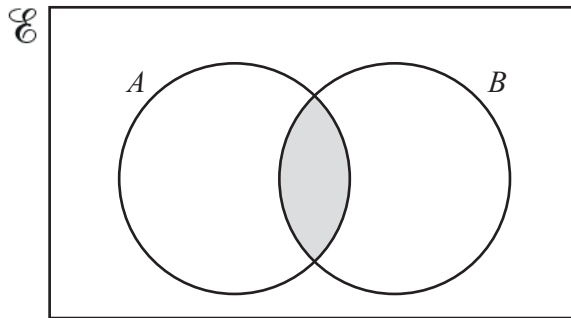


Find $n(A \cap B)'$.

..... [1]

[Total: 1]

3



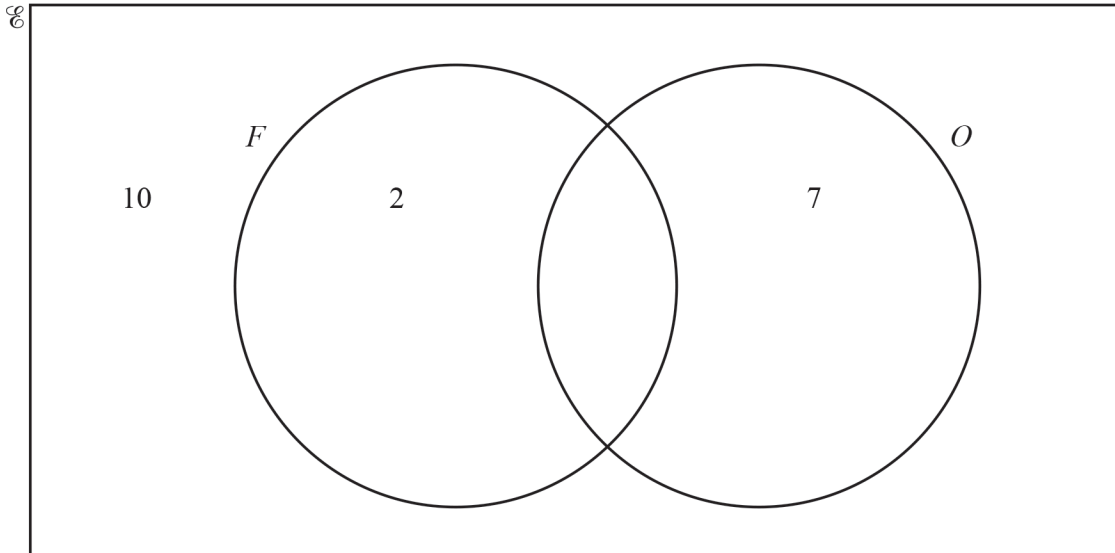
Use set notation to describe the shaded region.

..... [1]

[Total: 1]

- 4 $\mathcal{C} = \{x : x \text{ is a natural number } \leq 15\}$
 $F = \{x : x \text{ is a factor of } 12\}$
 $O = \{x : x \text{ is an odd number}\}$

(a) Complete the Venn diagram to show the elements of these sets.



[2]

(b) Write down one number that is in set O , but not in set F .

..... [1]

(c) Find $n(F \cup O)$.

..... [1]

(d) A number is chosen at random from \mathcal{C} .

Work out the probability that this number is in set O .

..... [1]

[Total: 5]

- 5 $C = \{x : x \text{ is an integer and } 5 < x < 12\}$ $D = \{5, 10\}$

Find $n(C \cup D)$.

..... [1]

[Total: 1]

- 6 $C = \{x : x \text{ is an integer and } 5 < x < 12\}$ $D = \{5, 10\}$

Put a ring around the correct statement from the list below.

$$D = \emptyset$$

$$C \cap D = \{10\}$$

$$6 \in D$$

$$D \subset C$$

[1]

[Total: 1]

- 7 There are 50 families in a village.

$C = \{\text{families who own a car}\}$

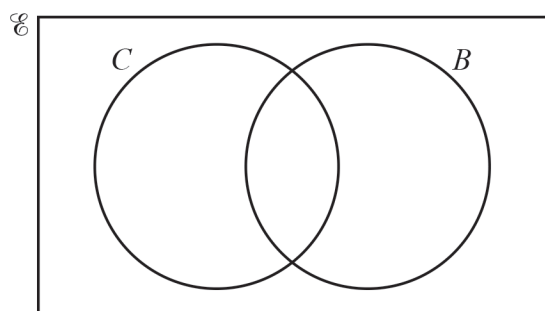
$B = \{\text{families who own a bicycle}\}$

23 families own a car.

10 families own a car and a bicycle.

6 families own no cars and no bicycles.

- (a) Complete the Venn diagram.



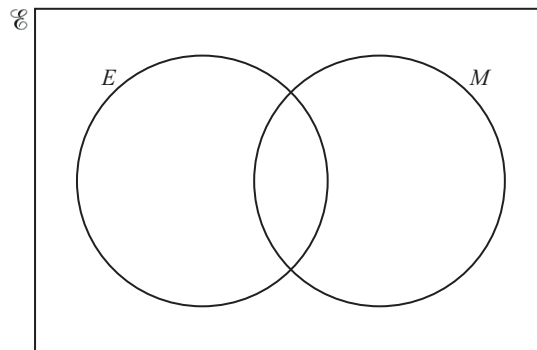
[2]

- (b) Find $n(C \cup B)$.

..... [1]

[Total: 3]

- 8 $\mathcal{U} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$
 $E = \{x: x \text{ is an even number}\}$
 $M = \{x: x \text{ is a multiple of 3}\}$



(a) Complete the Venn diagram. [2]

(b) Write down $n(E \cup M)$.

..... [1]

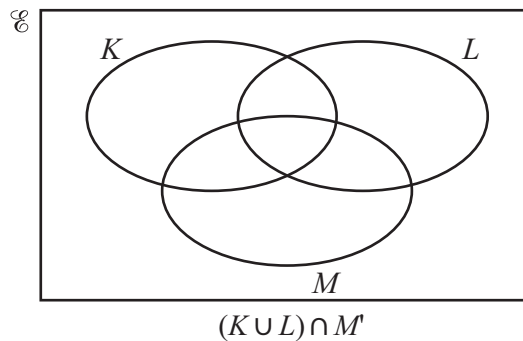
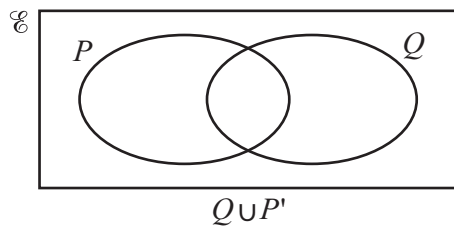
(c) A number is chosen at random from the universal set \mathcal{U} .

Write down the probability that the number is in the set $E \cap M$.

..... [2]

[Total: 5]

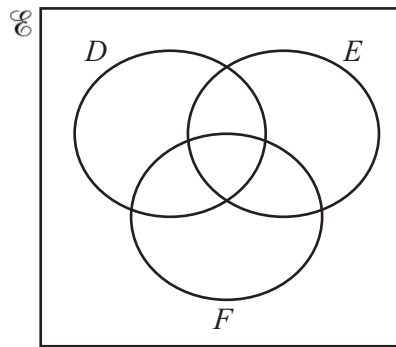
- 9 Shade the correct region in each Venn diagram.



[2]

[Total: 2]

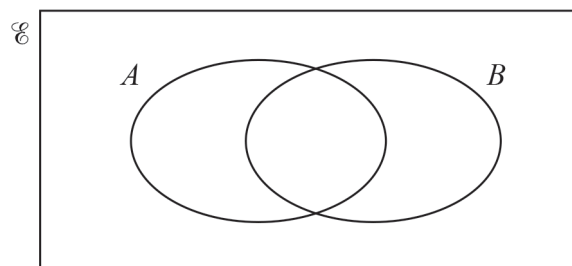
- 10 Shade the region $D' \cup (E \cap F)'$.



[1]

[Total: 1]

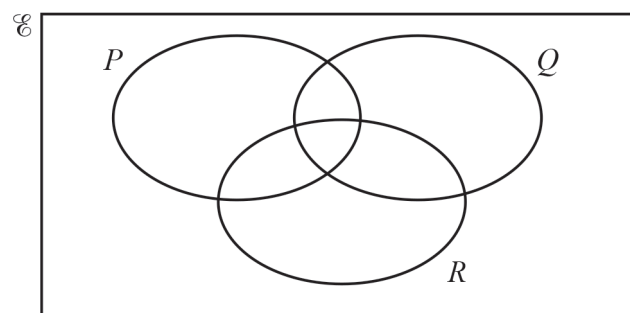
- 11 On the Venn diagram, shade the region $A \cap B$.



[1]

[Total: 1]

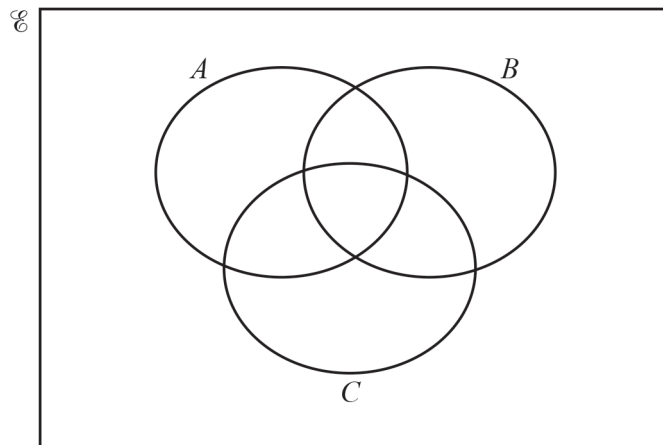
- 12 Shade the region $P \cup (Q \cap R)'$.



[1]

[Total: 1]

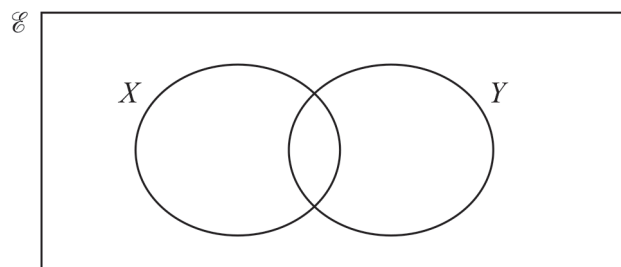
- 13** In this Venn diagram, shade the region $(A \cup B') \cap C$.



[1]

[Total: 1]

- 14** In the Venn diagram, shade $X' \cap Y$.



[1]

[Total: 1]