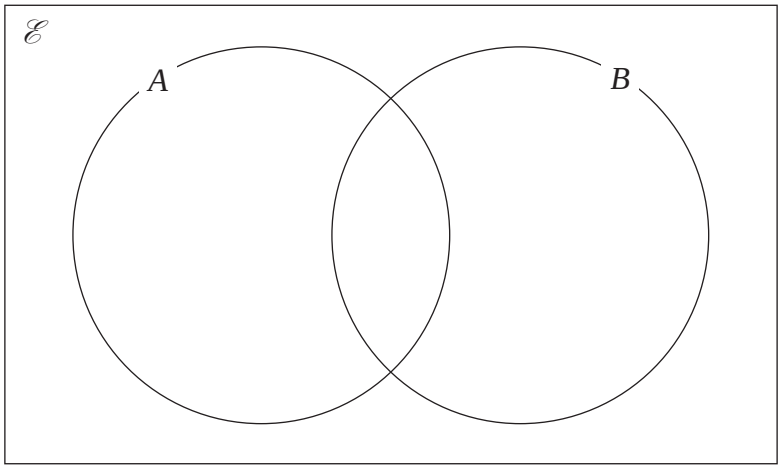
1 $\mathscr{E}$ = {whole numbers from 1 to 15}

A = {even numbers}

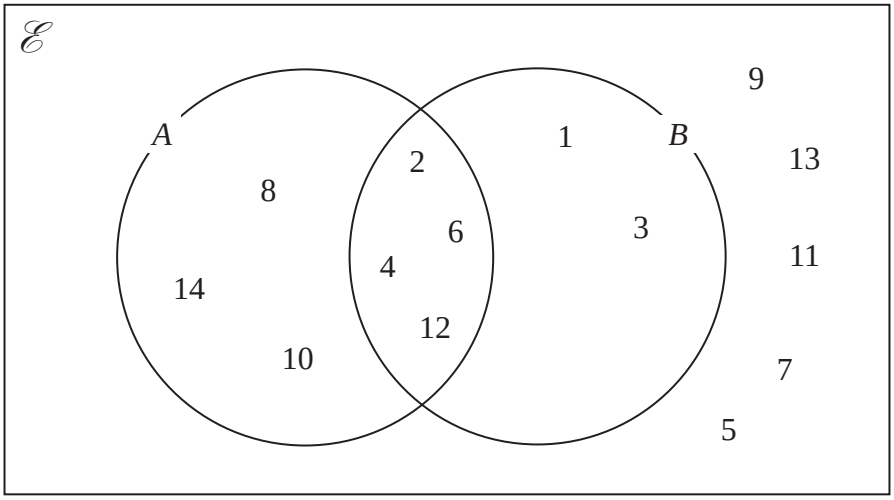
B = {3, 6, 9, 12, 15}

Complete the Venn diagram for the sets $\mathscr{E}$, A and B.



(Total for Question 1 is 3 marks)

2 The numbers from 1 to 14 are shown in the Venn diagram.



(a) List the members of the set $A \cap B$

.....

(1)

(b) List the members of the set B'

.....

(1)

A number is picked at random from the numbers in the Venn diagram.

(c) Find the probability that this number is in set A but is **not** in set B.

.....

(2)

(Total for Question 2 is 4 marks)

3 $B = \{b, l, u, e\}$

$G = \{g, r, e, y\}$

$W = \{w, h, i, t, e\}$

(a) List all the members of the set

(i) $B \cup G$

.....

(ii) $W \cap G'$

.....

(2)

Serena writes down the statement $B \cap G \cap W = \varnothing$

(b) Is Serena's statement correct?
You must give a reason for your answer.

.....

.....

.....

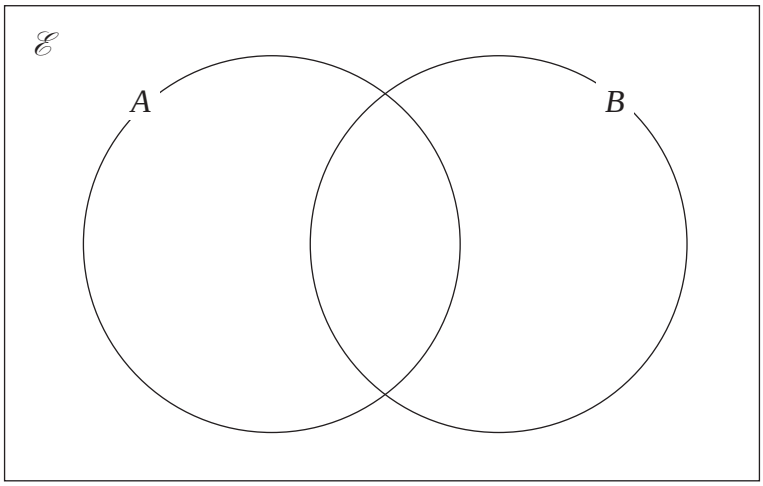
(1)

(Total for Question 3 is 3 marks)

4 $\mathscr{E}$ = {10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20}

A = {multiples of 5}
B = {even numbers}

Complete the Venn diagram for this information.

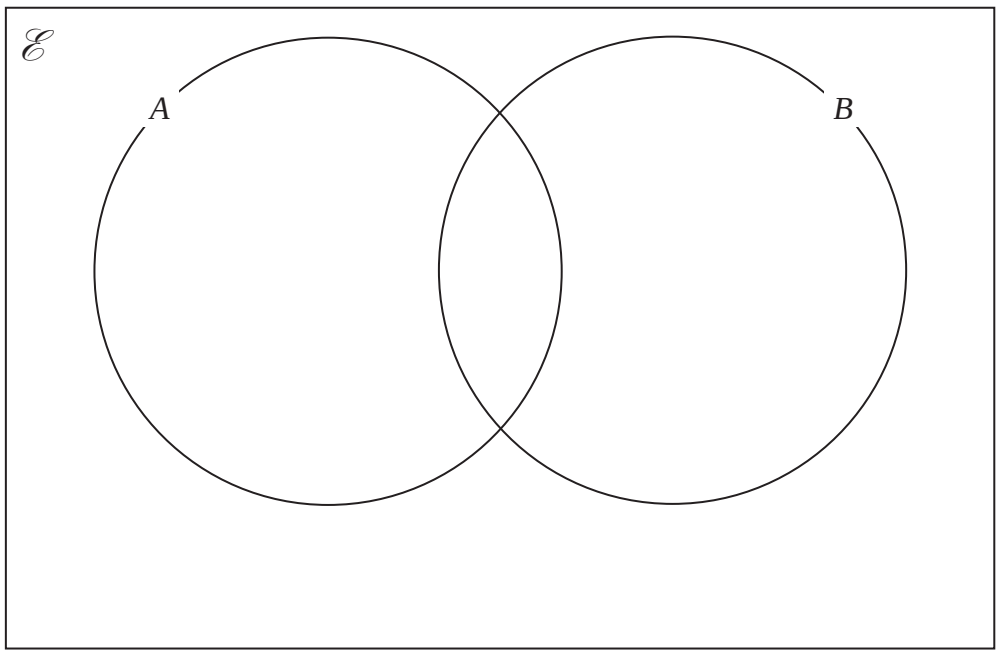


(Total for Question 4 is 3 marks)

5 $\mathscr{E}$ = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15}

A = {even numbers}

B = {multiples of 3}



Complete the Venn diagram for the sets $\mathscr{E}$, A and B.

(Total for Question 5 is 3 marks)

6 $\mathscr{E}$ = {letters of the alphabet}
B = {b, r, a, z, i, l}
I = {i, r, e, l, a, n, d}

(a) List the members of the set

(i) $B \cup I$

.....

(ii) $B \cap I'$

.....

(2)

K = {k, e, n, y, a}

Cody writes down the statement $B \cap K = \varnothing$
Cody's statement is wrong.

(b) Explain why.

.....

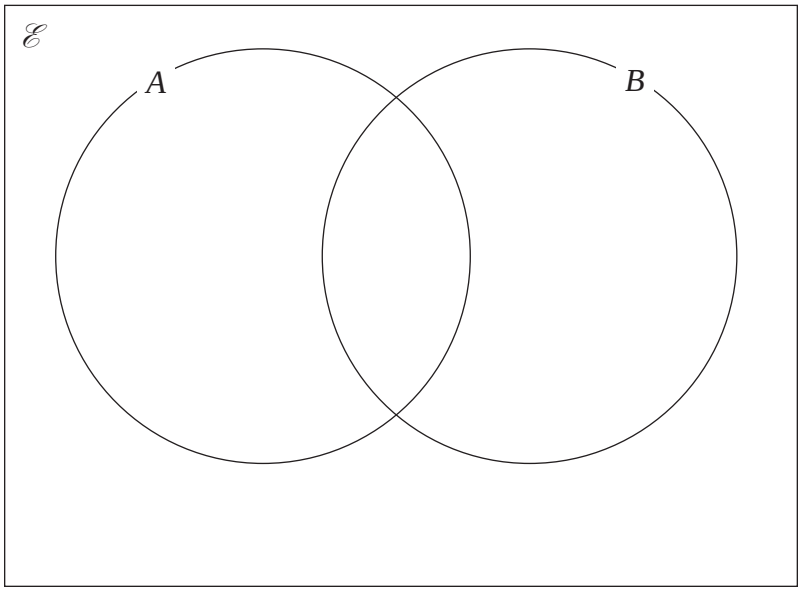
.....

(1)

(Total for Question 6 is 3 marks)

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

(a) Complete the Venn diagram below for the sets $\mathscr{E}$, A and B.



(3)

One of the numbers in $\mathscr{E}$ is to be chosen at random.

(b) Find the probability that this number is not in set A **and** not in set B.

.....

(2)

(Total for Question 7 is 5 marks)

8 $\mathscr{E} = \{21, 22, 23, 24, 25, 26, 27, 28, 29, 30\}$
$A = \{22, 24, 26, 28, 30\}$
$B = \{21, 24, 27, 30\}$

(a) List the members of the set

(i) $A \cap B$

.....

(ii) A'

.....

(2)

$C = \{23, 25, 29\}$

(b) Using set notation, find an expression for C in terms of A and B.

.....

(1)

(Total for Question 8 is 3 marks)

9 $\mathscr{E}$ = {20, 21, 22, 23, 24, 25, 26, 27, 28, 29}

A = {odd numbers}
B = {multiples of 3}

List the members of the set

(i) $A \cap B$

.....

(1)

(ii) $A \cup B$

.....

(1)

(Total for Question 9 is 2 marks)

10 $\mathscr{E}$ = {9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20}
A = {multiples of 3}
B = {odd numbers}

(a) List the members of the set

(i) $A \cap B$

.....

(1)

(ii) $A \cup B$

.....

(1)

(b) Is it true that $24 \in A$?

Tick one of the boxes below.

Yes	No
☐	☐

Give a reason for your answer.

.....

.....

(1)

Set C has 4 members such that $C \cap B' = \{10, 18\}$

(c) List the members of one possible set C

.....

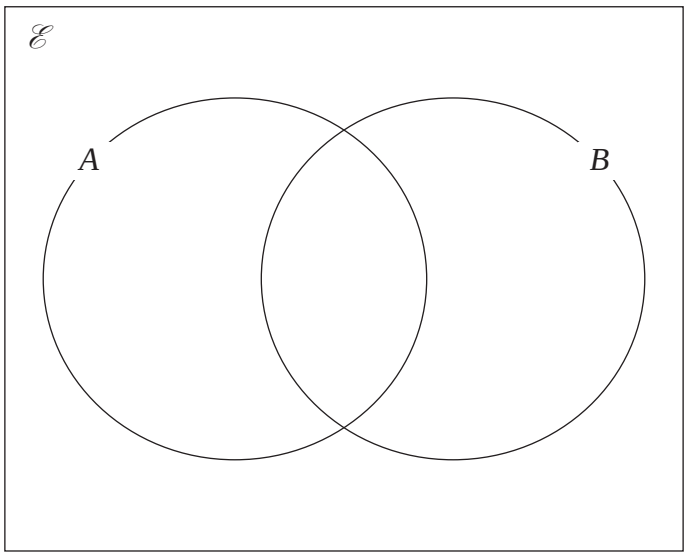
(2)

(Total for Question 10 is 5 marks)

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

$A = \{2, 3, 7, 8, 9\}$
$B = \{1, 2, 4, 5, 7, 8, 10\}$

Complete the Venn diagram for this information.



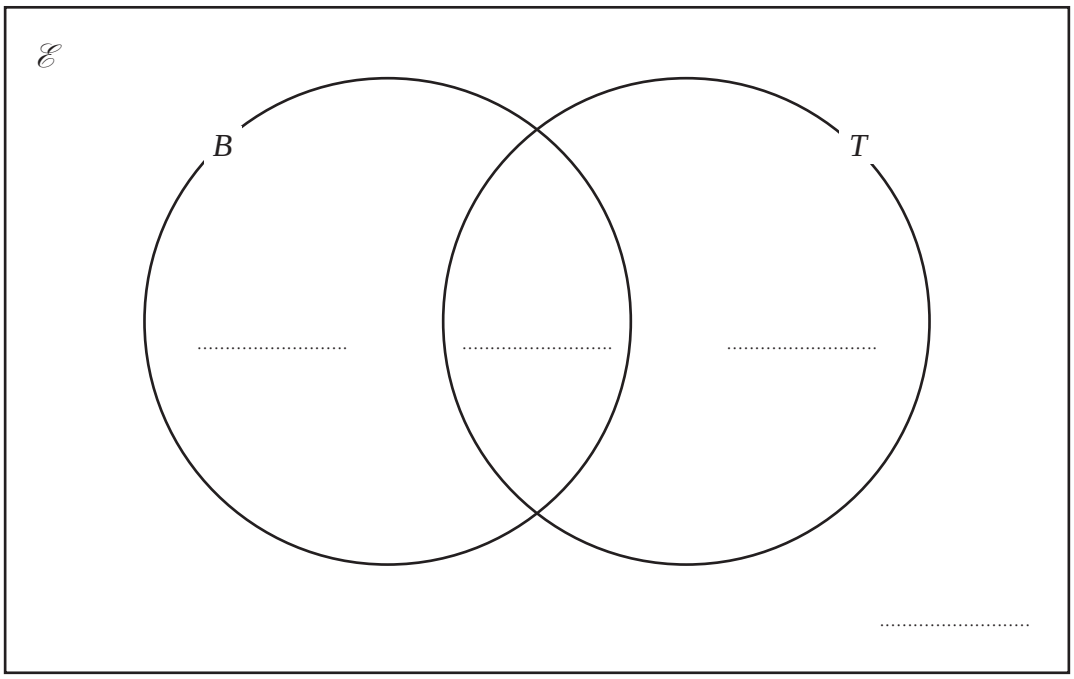
(Total for Question 11 is 3 marks)

12 50 students have lessons at a dance school.
Two of the lessons are ballet lessons (B) and tap lessons (T).

Of the 50 students

31 have ballet lessons
27 have tap lessons
18 have ballet lessons and tap lessons

Complete the Venn diagram for this information.



(Total for Question 12 is 3 marks)

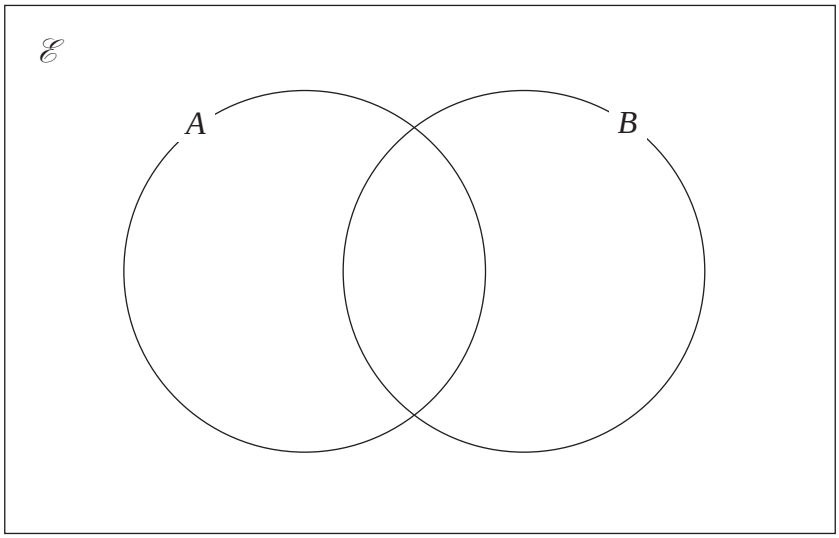
13 $\mathscr{E} = \{4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15\}$

$A \cap B = \{5, 10, 15\}$

$B' = \{7, 8, 9, 11, 12, 13, 14\}$

$A' = \{4, 6, 7, 8, 14\}$

Complete the Venn diagram for this information.



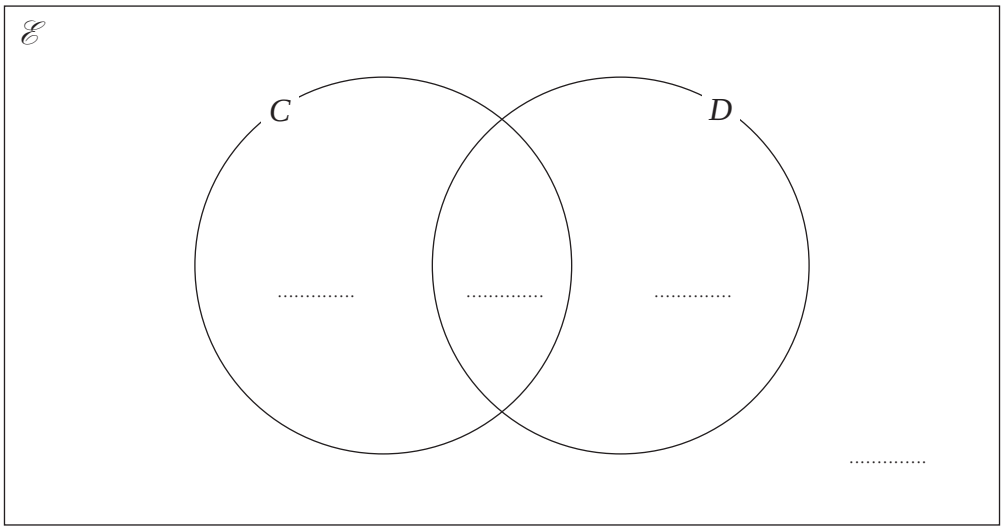
(Total for Question 13 is 3 marks)

14 30 children were asked whether they have a cat (C) or a dog (D)

Of the 30 children

5 have both a cat and a dog
13 have a dog
11 have **only** a cat

(a) Complete the Venn diagram.



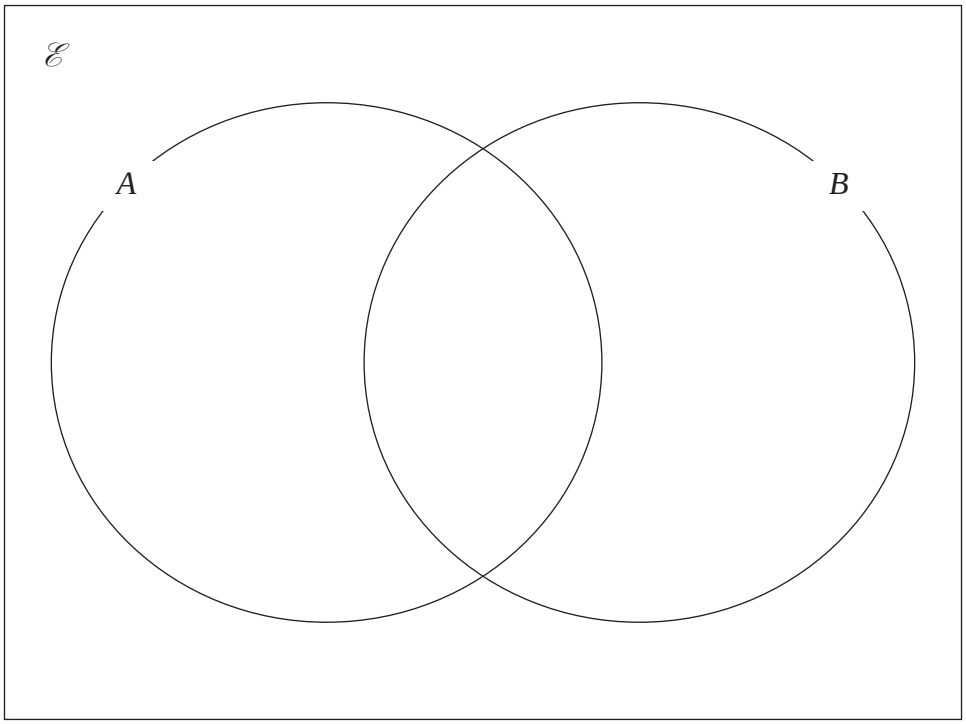
(3)

(Total for Question 14 is 3 marks)

15 $\mathscr{E}$ = {11, 12, 13, 14, 15, 16, 17, 18, 19, 20}

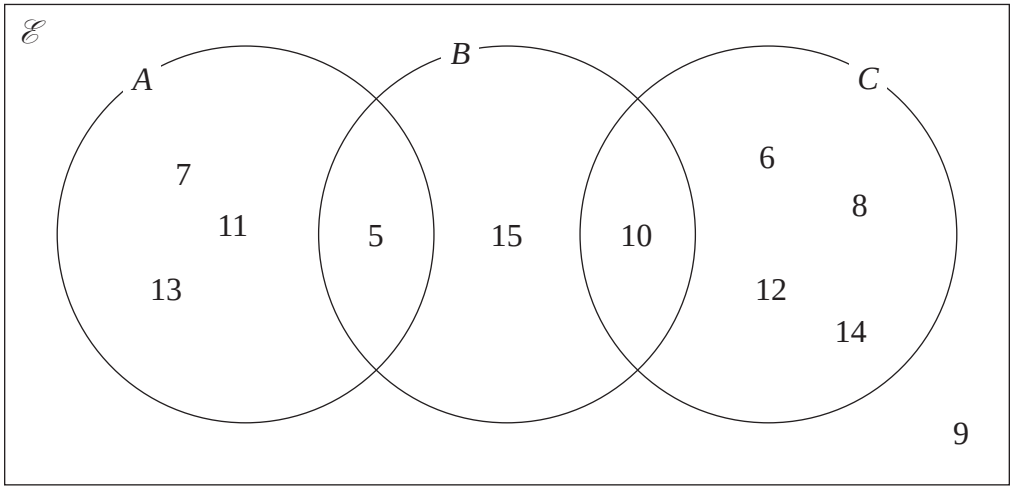
A = {even numbers}
$A \cap B$ = {12, 16, 20}
$(A \cup B)'$ = {17, 19}

Complete the Venn diagram for the sets $\mathscr{E}$, A and B



(Total for Question 15 is 3 marks)

16 Here is a Venn diagram.



(a) Write down the numbers that are in the set

(i) A

.....

(1)

(ii) $B \cup C$

.....

(1)

Dominic writes down $9 \notin C$

(b) Explain why Dominic is correct.

.....

.....

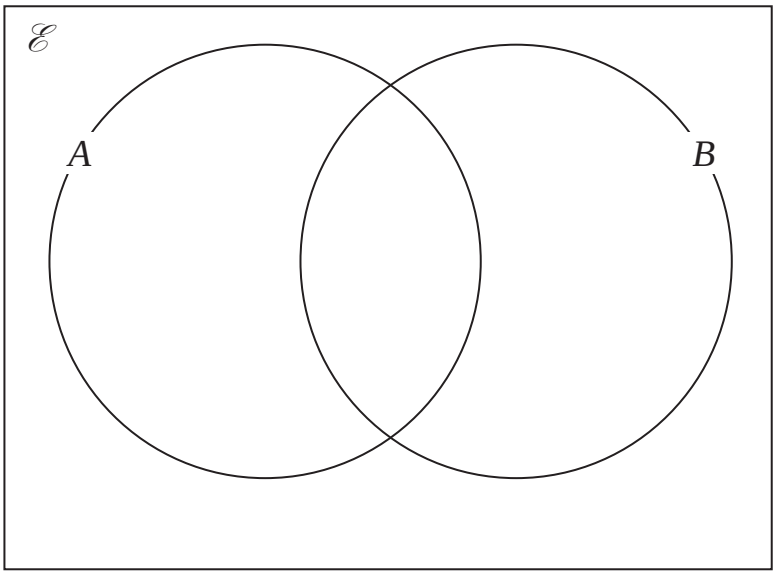
(1)

(Total for Question 16 is 3 marks)

17 $\mathscr{E}$ = {5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20}

A = {odd numbers}
B = {multiples of 5}

Complete the Venn diagram for this information.



(Total for Question 17 is 3 marks)