Sets & Venn Diagrams

Question Paper 4

Level	IGCSE
Subject	Maths (0580)
Exam Board	Cambridge International Examinations (CIE)
Paper Type	Extended
Topic	Number
Sub-Topic	Sets & Venn Diagrams
Booklet	Question Paper 4

Time Allowed: **52 minutes**

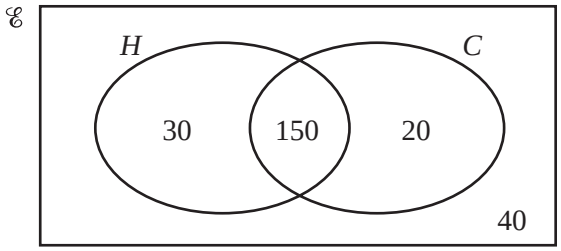
Score: **/43**

Percentage: **/100**

Grade Boundaries:

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

1



$\mathscr{E}$ = {240 passengers who arrive on a flight in Cyprus}

H = {passengers who are on holiday}

C = {passengers who hire a car}

(a) Write down the number of passengers who

(i) are on holiday,

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

(ii) hire a car but are not on holiday.

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

(b) Find the value of $n(H \cup C')$.

Answer(b) ..... [1]

(c) One of the 240 passengers is chosen at random.

Write down the probability that this passenger

(i) hires a car,

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

(ii) is on holiday and hires a car.

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

(d) Give your answers to this part correct to 4 decimal places.

Two of the 240 passengers are chosen at random.

Find the probability that

(i) they are both on holiday,

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

(ii) exactly one of the two passengers is on holiday.

Answer(d)(ii) ..... [3]

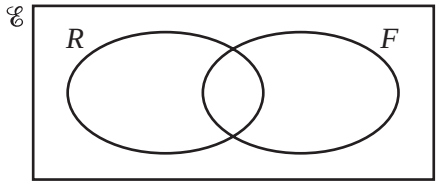
(e) Give your answer to this part correct to 4 decimal places.

Two passengers are chosen at random from those on holiday.

Find the probability that they both hire a car.

Answer(e) ..... [3]

2



In the Venn diagram, $\mathscr{E}$ = {students in a survey}, R = {students who like rugby} and F = {students who like football}.

$n(\mathscr{E}) = 20$ $n(R \cup F) = 17$ $n(R) = 13$ $n(F) = 11$

(a) Find

(i) $n(R \cap F)$,

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

(ii) $n(R' \cap F)$.

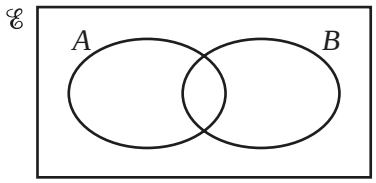
Answer(a)(ii) ..... [1]

(b) A student who likes rugby is chosen at random.

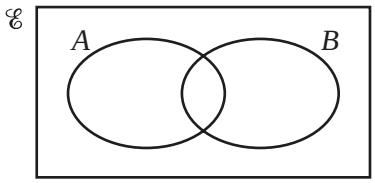
Find the probability that this student also likes football.

Answer(b) ..... [1]

3 Shade the required region on each Venn diagram.



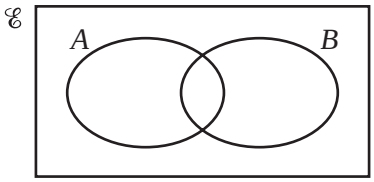
$A \cup B'$



$(A \cap B)'$

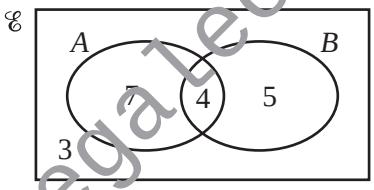
[2]

4 **(a)**



Shade the region A ∩ B′. [1]

(b)



This Venn diagram shows the number of elements in each region.

Write down the value of n $(A \cup B')$.

Answer(b) n $(A \cup B')$ = ... [1]

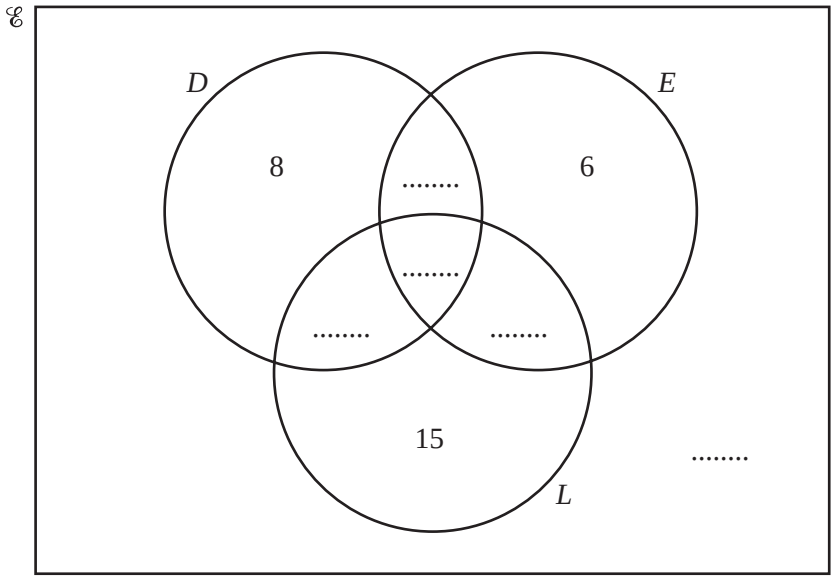
5 In a survey of 60 cars, 25 use diesel, 20 use liquid hydrogen and 22 use electricity.

No cars use all three fuels and 14 cars use both diesel and electricity.

There are 8 cars which use diesel only, 15 cars which use liquid hydrogen only and 6 cars which use electricity only.

In the Venn diagram below

$\mathscr{E}$ = {cars in the survey},
D = {cars which use diesel},
L = {cars which use liquid hydrogen},
E = {cars which use electricity}.



(a) Use the information above to fill in the five missing numbers in the Venn diagram. [4]

(b) Find the number of cars which use diesel but not electricity.

Answer(b) ..... [1]

(c) Find n($D' \cap (E \cup L)$).

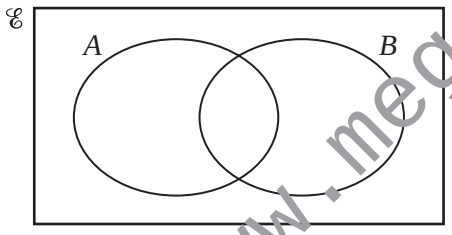
Answer(c) ..... [1]

6 In a group of 30 students, 18 have visited Australia, 15 have visited Botswana and 5 have not visited either country.

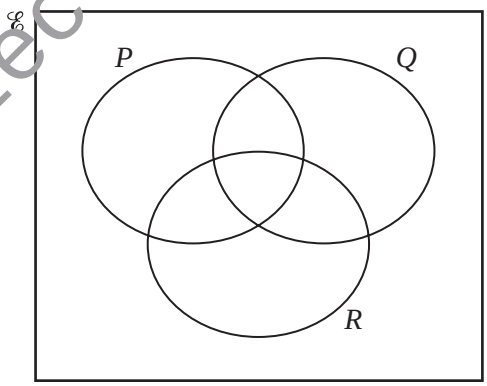
Work out the number of students who have visited Australia but not Botswana.

Answer ..... [2]

7 Shade the required region on each Venn diagram.



$A \cap B'$



$(P \cup Q) \cap R'$

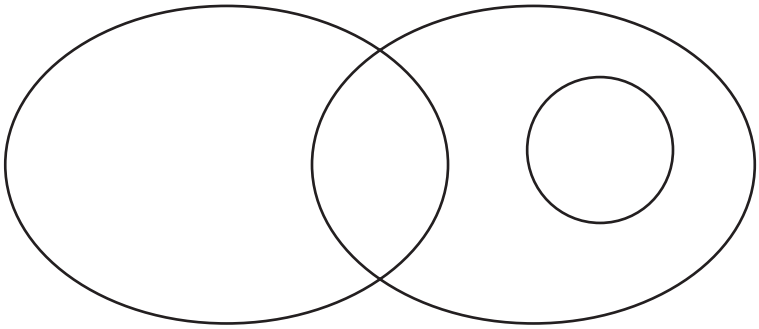
[2]

8 In a group of 24 students, 21 like football and 15 like swimming.
One student does **not** like football and does **not** like swimming.
Find the number of students who like **both** football and swimming.

Answer ..... [2]

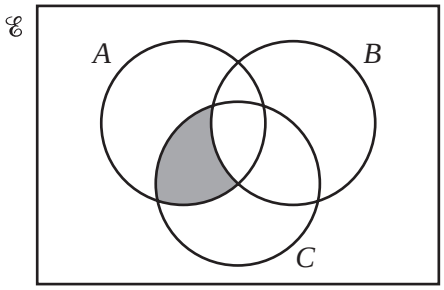
9 $Q = \{2, 4, 6, 8, 10\}$ and $R = \{5, 10, 15, 20\}$.
$15 \in P$, $n(P) = 1$ and $P \cap Q = \emptyset$.

Label each set and complete the Venn diagram to show this information.



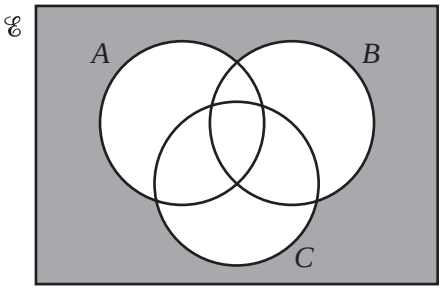
[3]

10



The shaded area in the diagram shows the set $(A \cap C) \cap B'$.

Write down the set shown by the shaded area in each diagram below.



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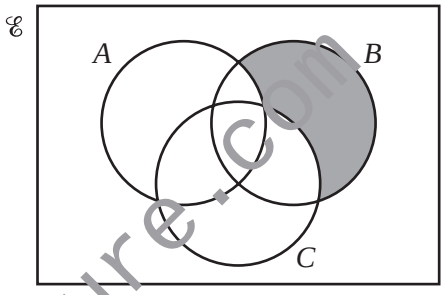
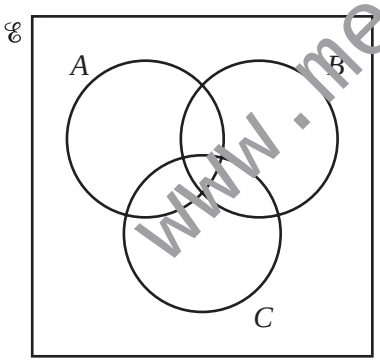


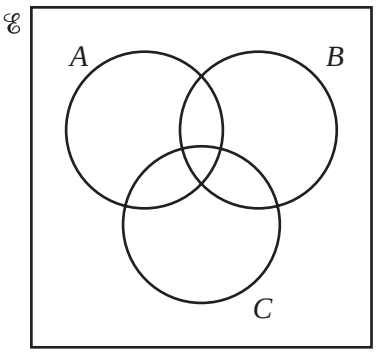
.....

[2]

11 Shade the required regions in the Venn diagrams below.



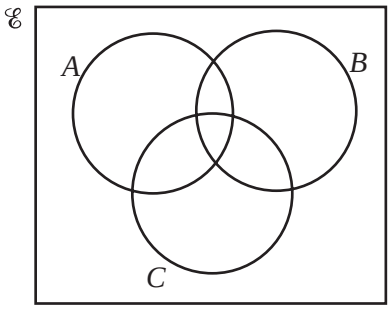
$(A \cup B)' \cap C$



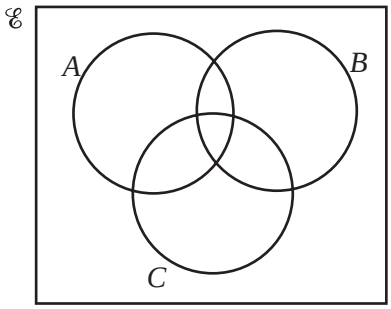
$(A \cap B) \cup C$

[2]

12 Shade the region required in each Venn Diagram.



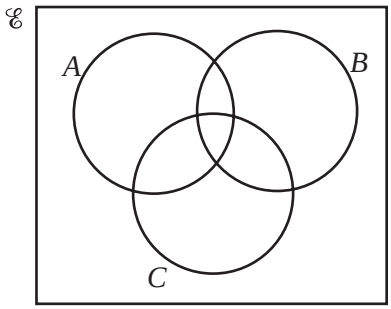
$A' \cap (B \cap C)$



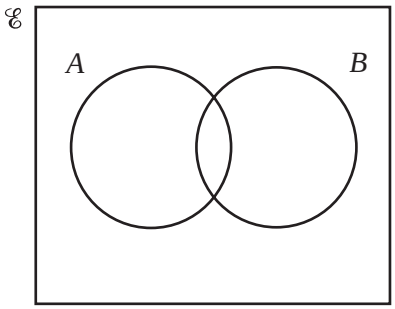
$A' \cap (B \cup C)$

[2]

13 Shade the region required in each Venn Diagram.



$A \cap B \cap C$



$A \cup B'$

[2]