

Sets & Venn Diagrams

Question Paper 2

Level	IGCSE
Subject	Maths (0580)
Exam Board	Cambridge International Examinations (CIE)
Paper Type	Extended
Topic	Number
Sub-Topic	Sets & Venn Diagrams
Booklet	Question Paper 2

Time Allowed: 53 minutes

Score: /44

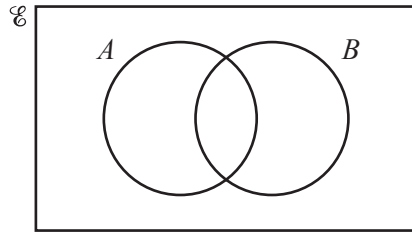
Percentage: /100

Grade Boundaries:

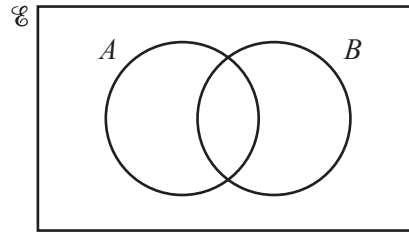
A*	A	B	C	D	E	U
>85%	75%	60%	45%	35%	25%	<25%



1 Shade the region required in each Venn diagram.



$$(A \cup B)'$$



$$A' \cap B$$

[2]



- 2 The lights and brakes of 30 bicycles are tested.
The table shows the results.

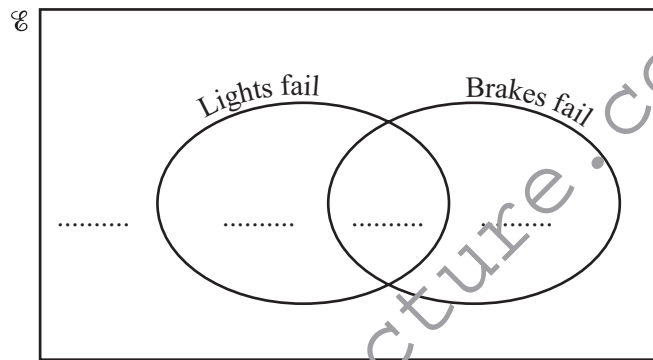
	Lights	Brakes
Fail test	3	9
Pass test	27	21

The lights and brakes both failed on one bicycle only.

$\mathcal{U} = \{30 \text{ bicycles}\}$

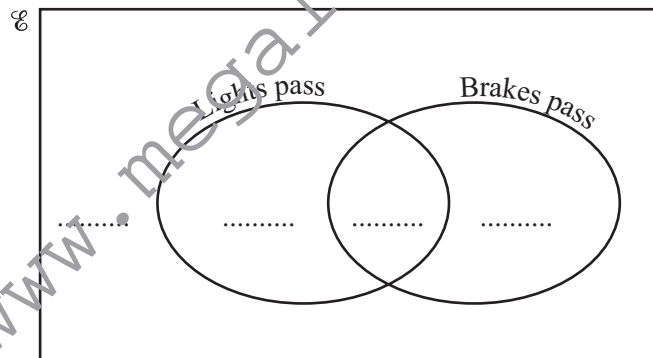
Complete the Venn diagrams.

(a)



[2]

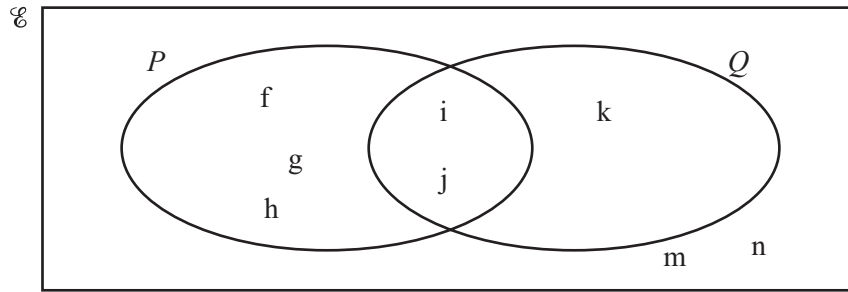
(b)



[2]



3



(a) Use the information in the Venn diagram to complete the following.

(i) $P \cap Q = \{ \dots \}$ [1]

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

(iii) $n(P \cup Q)' = \dots$ [1]

(b) A letter is chosen at random from the set Q .

Find the probability that it is also in the set P .

Answer(b) [1]

(c) On the Venn diagram shade the region $P' \cap Q$.

[1]

(d) Use a set notation symbol to complete the statement.

$\{f, g, h\} \dots P$

[1]

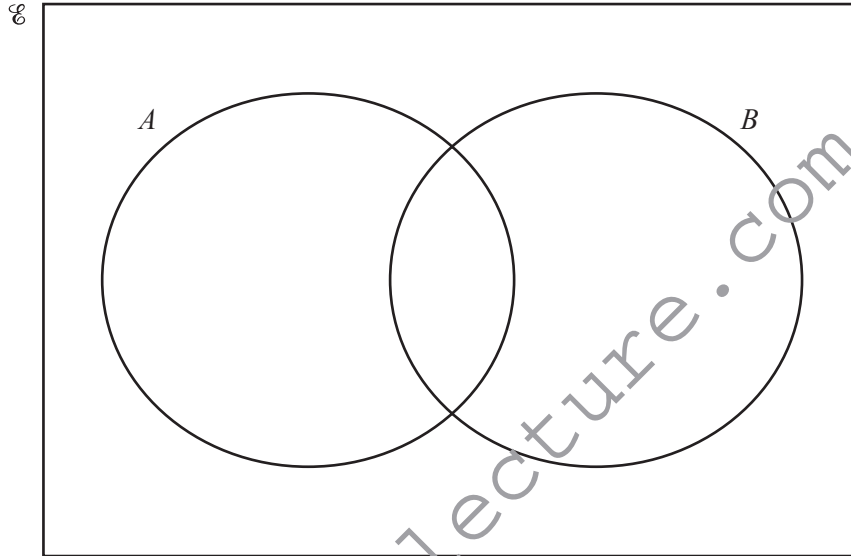


4 $\mathcal{E} = \{x : 1 \leq x \leq 10, \text{ where } x \text{ is an integer}\}$

$A = \{\text{square numbers}\}$

$B = \{1, 2, 3, 4, 5, 6\}$

(a) Write all the elements of \mathcal{E} in their correct place in the Venn diagram.



[2]

(b) List the elements of $(A \cup B)'$.

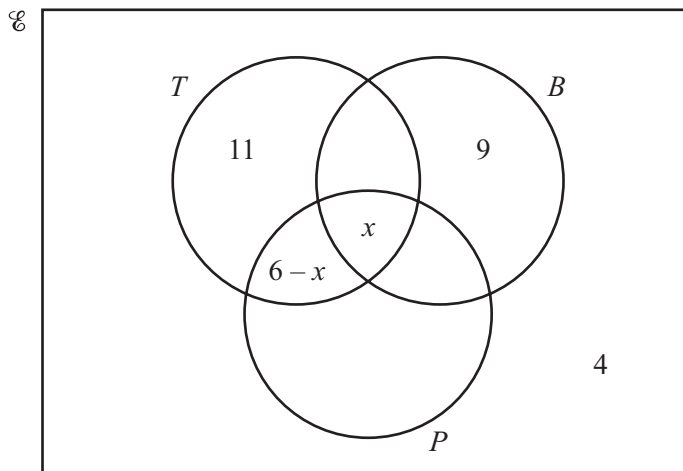
Answer(b) [1]

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

Answer(c) [1]



5



In the Venn diagram, $\mathcal{E} = \{\text{children in a nursery}\}$

- $B = \{\text{children who received a book for their birthday}\}$
- $T = \{\text{children who received a toy for their birthday}\}$
- $P = \{\text{children who received a puzzle for their birthday}\}$

x children received a book and a toy and a puzzle.
 6 children received a toy and a puzzle.

- (a) 4 children received a book and a toy.
 5 children received a book and a puzzle.
 7 children received a puzzle but not a book and not a toy.

Complete the Venn diagram above.

[3]

- (b) There are 40 children in the nursery.

Using the Venn diagram, write down and solve an equation in x .

Answer(b)

[3]



(c) Work out

(i) the probability that a child, chosen at random, received a book but not a toy and not a puzzle,

Answer(c)(i) [1]

(ii) the number of children who received a book and a puzzle but not a toy,

Answer(c)(ii) [1]

(iii) $n(B)$,

Answer(c)(iii) [1]

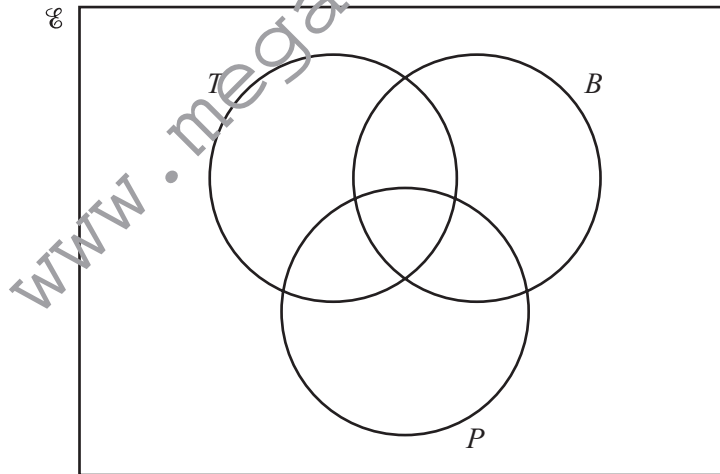
(iv) $n(B \cup P)$,

Answer(c)(iv) [1]

(v) $n(B \cup T \cup P)$.

Answer(c)(v) [1]

(d)

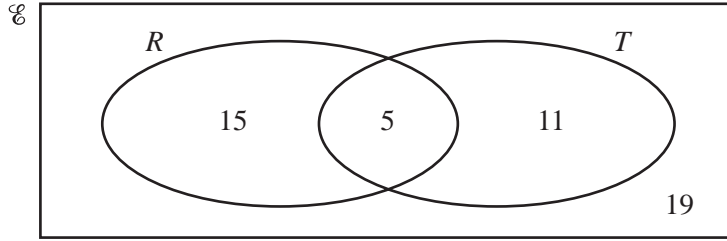


Shade the region $B \cap (T \cup P)$.

[1]



6



The Venn diagram shows the number of red cars and the number of two-door cars in a car park. There is a total of 50 cars in the car park. $R = \{\text{red cars}\}$ and $T = \{\text{two-door cars}\}$.

(a) A car is chosen at random.

Write down the probability that

(i) it is red and it is a two-door car,

Answer(a)(i) [1]

(ii) it is not red and it is a two-door car.

Answer(a)(ii) [1]

(b) A two-door car is chosen at random.

Write down the probability that it is not red.

Answer(b) [1]

(c) Two cars are chosen at random.

Find the probability that they are both red.

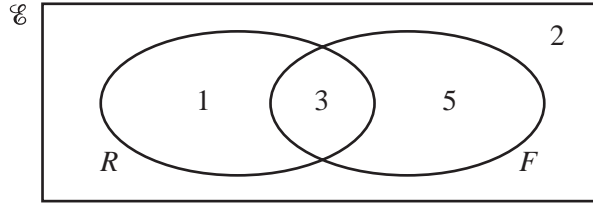
Answer(c) [2]

(d) On the Venn diagram, shade the region $R \cup T'$.

[1]



7



11 students are asked if they like rugby (R) and if they like football (F).
The Venn diagram shows the results.

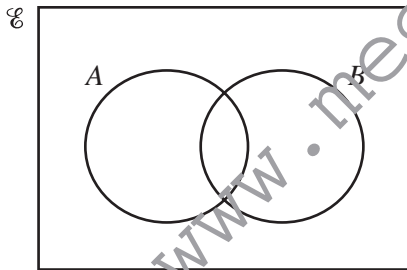
(a) A student is chosen at random.

What is the probability that the student likes rugby **and** football?

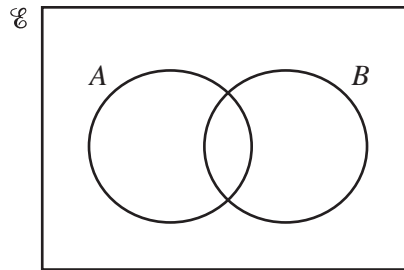
Answer(a) [1]

(b) On the Venn diagram shade the region $R' \cap F'$. [1]

8 Shade the required region on each Venn diagram.



$A' \cap B$



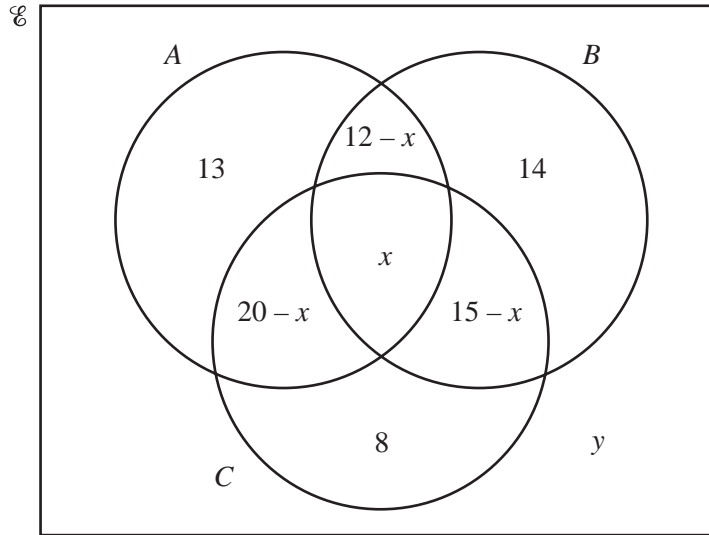
$A' \cap B'$

[2]



8

9



The Venn diagram shows the number of elements in sets A , B and C .

(a) $n(A \cup B \cup C) = 74$

Find x .

Answer(a) $x = \dots\dots\dots$ [2]

(b) $n(U) = 100$

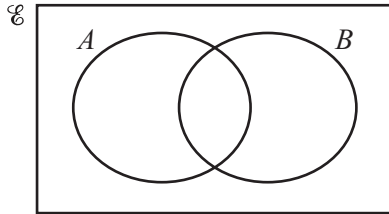
Find y .

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

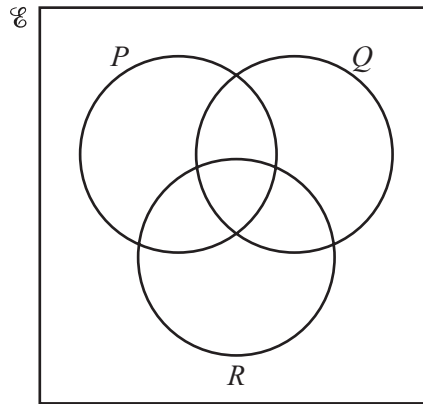
(c) Find the value of $n((A \cup B)' \cap C)$.


..... [1]

10 Shade the required region in each of the Venn diagrams.



A'



$(P \cap R) \cup Q$

[2]

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