



Sets & Venn Diagrams

Question Paper 5

Level	IGCSE
Subject	Maths (0580)
Exam Board	Cambridge International Examinations (CIE)
Paper Type	Extended
Topic	Number
Sub-Topic	Sets & Venn Diagrams
Booklet	Question Paper 5

Time Allowed: 60 minutes

Score: /50

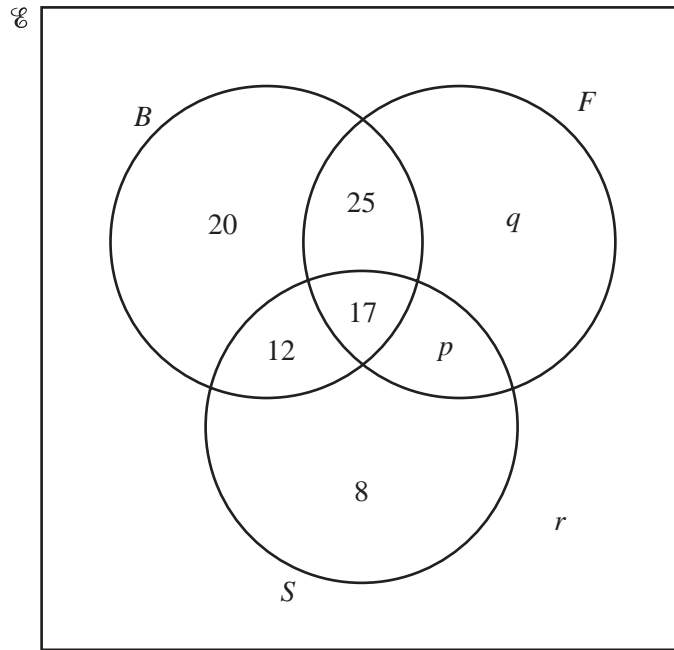
Percentage: /100

Grade Boundaries:

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

1 In a survey, 100 students are asked if they like basketball (B), football (F) and swimming (S).

The Venn diagram shows the results.



42 students like swimming.

40 students like exactly one sport.

- (a) Find the values of p , q and r . [3]
- (b) How many students like
- (i) all three sports, [1]
 - (ii) basketball and swimming but not football? [1]
- (c) Find
- (i) $n(B')$, [1]
 - (ii) $n((B \cup F) \cap S')$. [1]
- (d) One student is chosen at random from the 100 students.
Find the probability that the student
- (i) only likes swimming, [1]
 - (ii) likes basketball but not swimming. [1]
- (e) Two students are chosen at random from those who like basketball.
Find the probability that they each like exactly one other sport. [3]

5

2 $\mathcal{E} = \{1,2,3,4,5,6,7,9,11,16\}$ $P = \{2,3,5,7,11\}$ $S = \{1,4,9,16\}$ $M = \{3,6,9\}$

(a) Draw a Venn diagram to show this information.

[2]

(b) Write down the value of $n(M' \cap P)$.

Answer(b) [1]

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3 A and B are sets.

Write the following sets in their simplest form.

(a) $A \cap A'$.

Answer(a) [1]

(b) $A \cup A'$.

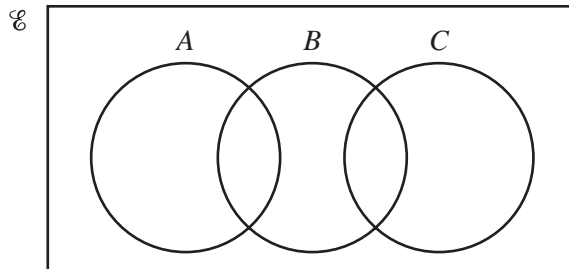
Answer(b) [1]

(c) $(A \cap B) \cup (A \cap B')$.

Answer(c) [1]

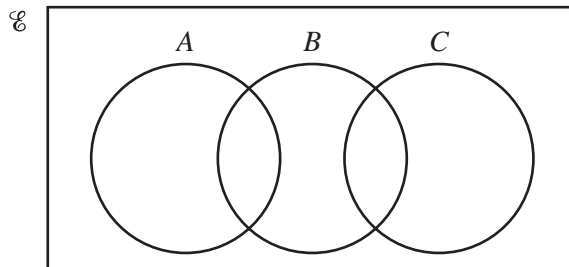
4 On the Venn diagrams shade the regions

(a) $A' \cap C'$,



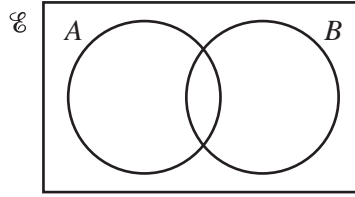
[1]

(b) $(A \cup C) \cap B$.



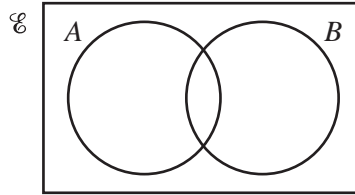
[1]

5 (a) Shade the region $A \cap B$.



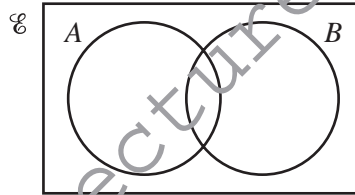
[1]

(b) Shade the region $(A \cup B)'$.



[1]

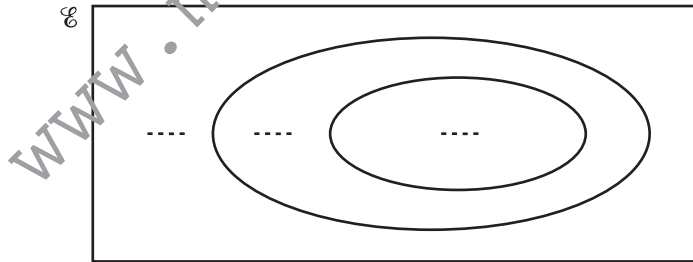
(c) Shade the complement of set B.



[1]

6 $n(A) = 18$, $n(B) = 11$ and $n(A \cup B)' = 0$.

(a) Label the Venn diagram to show the sets A and B where $n(A \cup B) = 18$. Write down the number of elements in each region.

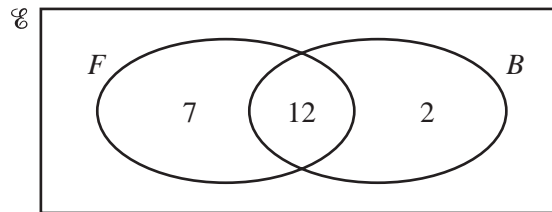


[2]

(b) Draw another Venn diagram to show the sets A and B where $n(A \cup B) = 29$. Write down the number of elements in each region.



- 7 (a) All 24 students in a class are asked whether they like football and whether they like basketball. Some of the results are shown in the Venn diagram below.



$\mathcal{U} = \{\text{students in the class}\}.$

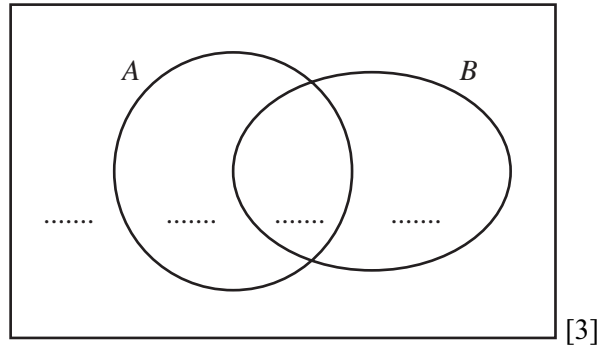
$F = \{\text{students who like football}\}.$

$B = \{\text{students who like basketball}\}.$

- (i) How many students like both sports? [1]
- (ii) How many students do not like either sport? [1]
- (iii) Write down the value of $n(F \cup B)$. [
- (iv) Write down the value of $n(F' \cap B)$. [
- (v) A student from the class is selected at random.
What is the probability that this student likes basketball? [1]
- (vi) A student who likes football is selected at random.
What is the probability that this student likes basketball? [1]
- (b) Two students are selected at random from a group of 10 boys and 12 girls.
Find the probability that
- (i) they are both girls, [2]
- (ii) one is a boy and one is a girl. [3]

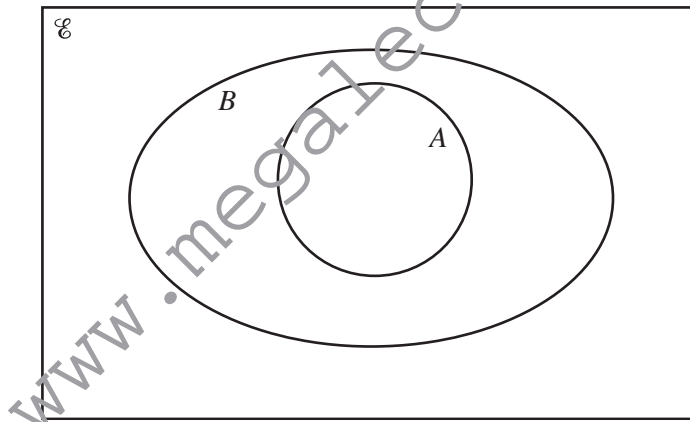
- 8 $n(\mathcal{U}) = 21, n(A \cup B) = 19, n(A \cap B) = 8$ and $n(A) = 12$.
Complete the Venn diagram to show this information.

Answer \mathcal{U}



- 9 $\mathcal{U} = \{40, 41, 42, 43, 44, 45, 46, 47, 48, 49\}$
 $A = \{\text{prime numbers}\}$
 $B = \{\text{odd numbers}\}$

(a) Place the 10 numbers in the correct places on the Venn diagram.



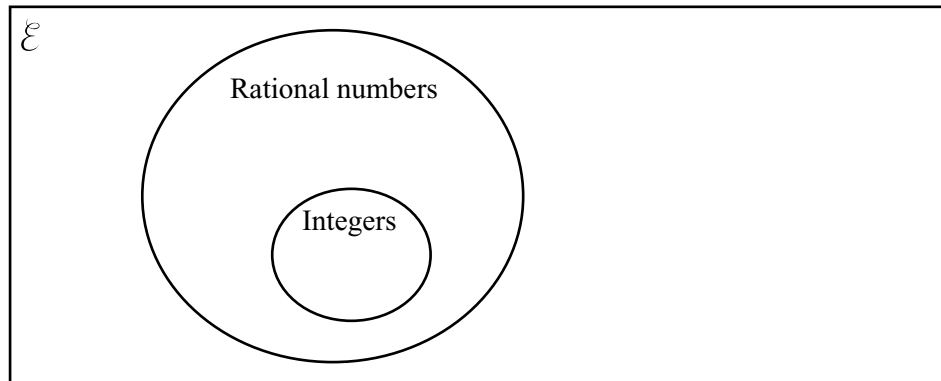
[2]

(b) State the value of $n(B \cap A')$.

Answer(b) [1]

10 Write each of these four numbers in the correct place in the Venn Diagram below.

$$2.6, \frac{4}{17}, \sqrt{12}, \sqrt{\frac{112}{7}}$$



[4]

11 Three sets A , B and K are such that $A \subset K$, $B \subset K$ and $A \cap B = \emptyset$.
Draw a Venn diagram to show this information.

[2]