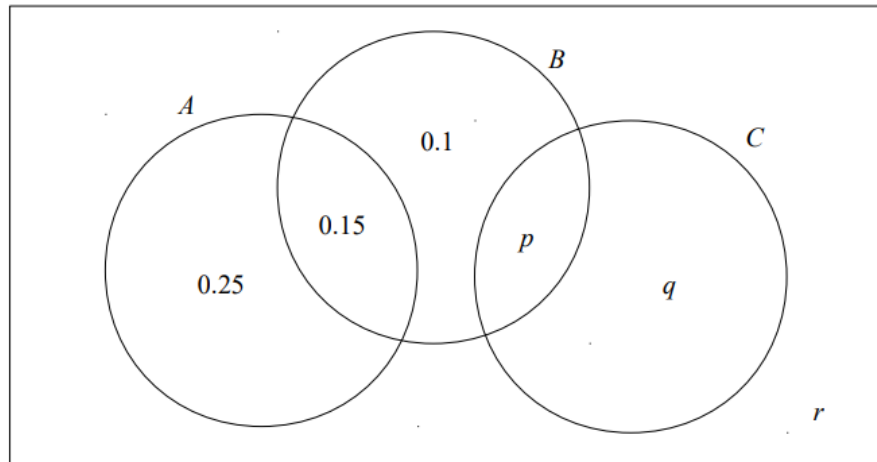


Venn diagrams

Q1

The Venn diagram below shows three events A , B and C .



(a) Write down two of the events that are mutually exclusive.

Events A and B are independent.
The probability of C is 0.3

(b) Find the values of p , q and r .

Q2

Raheem asks 50 people which sports they watch. They can choose from football, golf and hockey.

5 people watch all three sports.
8 people watch football and golf
7 people watch golf and hockey
9 people watch football and hockey
31 people watch football
13 people watch golf
17 people watch hockey.

(a) Draw a Venn diagram for this information.

(b) Two people are selected at random find the probability they both watch football.

Q3

A survey of the reading habits of some students revealed that, on a regular basis, 25% read quality newspapers, 45% read tabloid newspapers and 40% do not read newspapers at all.

(a) Find the proportion of students who read both quality and tabloid newspapers.

(3)

(b) In the space on page 13 draw a Venn diagram to represent this information.

(3)

Q4

There are 180 students at a college following a general course in computing. Students on this course can choose to take up to three extra options.

112 take systems support,
70 take developing software,
81 take networking,
35 take developing software and systems support,
28 take networking and developing software,
40 take systems support and networking,
4 take all three extra options.

(a) In the space below, draw a Venn diagram to represent this information.

(5)

A student from the course is chosen at random.

Find the probability that this student takes

(b) none of the three extra options,

(1)

(c) networking only.

(1)

Q5

The following shows the results of a wine tasting survey of 100 people.

96 like wine *A*,
93 like wine *B*,
96 like wine *C*,
92 like *A* and *B*,
91 like *B* and *C*,
93 like *A* and *C*,
90 like all three wines.

(a) Draw a Venn Diagram to represent these data.

(6)

Find the probability that a randomly selected person from the survey likes

(b) none of the three wines,

(1)

(c) wine *A* but not wine *B*,

(2)

(d) any wine in the survey except wine *C*,

(2)

(e) exactly two of the three kinds of wine.

(2)

Q6

(a) Given that $P(A) = a$ and $P(B) = b$ express $P(A \cup B)$ in terms of a and b when

- (i) A and B are mutually exclusive,
- (ii) A and B are independent.

(2)

Two events R and Q are such that

$$P(R \cap Q') = 0.15 \quad \text{and} \quad P(Q) = 0.35$$

Find the value of

(b) $P(R \cup Q)$,

(1)

(d) $P(R)$.

(2)

Q7

Jake and Kamil are sometimes late for school.

The events J and K are defined as follows

J = the event that Jake is late for school

K = the event that Kamil is late for school

$$P(J) = 0.25, \quad P(J \cap K) = 0.15 \quad \text{and} \quad P(J' \cap K') = 0.7$$

On a randomly selected day, find the probability that

- (a) at least one of Jake or Kamil are late for school,

(1)

- (b) Kamil is late for school.

(2)

The teacher suspects that Jake being late for school and Kamil being late for school are linked in some way.

- (d) Determine whether or not J and K are statistically independent.

(2)

- (e) Comment on the teacher's suspicion in the light of your calculation in (d).

(1)

Q8

- (a) State in words the relationship between two events R and S when $P(R \cap S) = 0$

(1)

The events A and B are independent with $P(A) = \frac{1}{4}$ and $P(A \cup B) = \frac{2}{3}$

Find

(b) $P(B)$

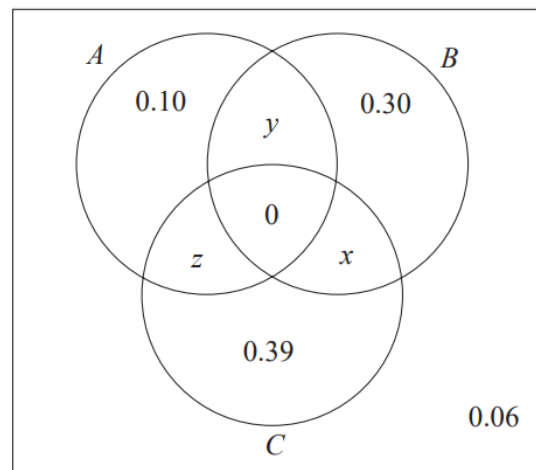
(4)

(c) $P(A' \cap B)$

(2)

Q9

The Venn diagram shows three events, A , B and C , and their associated probabilities.



Events B and C are mutually exclusive.

Events A and C are independent.

Showing your working, find the value of x , the value of y and the value of z .

(5)
