



Probability

Questions

Suitable for:
Pearson Edexcel International A-Level (iAL) — Statistics 1



Question 1

Two fair six-sided dice are rolled and their scores are multiplied together.

(a) Find the probability that the product is even.

(2 marks)

(b) Find the probability that the product is greater than 12.

(3 marks)

(c) Find the probability that the product is a perfect square.

(3 marks)

Total for question = 8 marks



Question 2

A fair spinner with sections numbered 1, 2, 3, 4 is spun and a fair coin is flipped.

(a) List all outcomes in the sample space.

(2 marks)

(b) Find the probability of obtaining a head and an even number.

(1 marks)

(c) Find the probability of obtaining a tail and a number greater than 2.

(1 marks)

Total for question = 4 marks





Question 3

Events A and B are such that

$$P(A) = 0.4 \quad P(B) = 0.35 \quad P(A \cap B) = 0.15$$

(a) Find

$$P(A \cup B)$$

(2 marks)

(b) Find

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

(2 marks)

Total for question = 4 marks





Question 4

Events A and B are such that

$$P(A) = 0.6 \quad P(A \cup B) = 0.8 \quad P(A \cap B) = 0.2$$

(a) Find $P(B)$.

(2 marks)

(b) Find

$$P(A' \mid B)$$

(2 marks)

Total for question = 4 marks



Question 5

Events A and B are mutually exclusive, with

$$P(A) = 0.3 \quad P(B) = 0.45$$

(a) Find

$$P(A \cup B)$$

(1 marks)

(b) Find

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

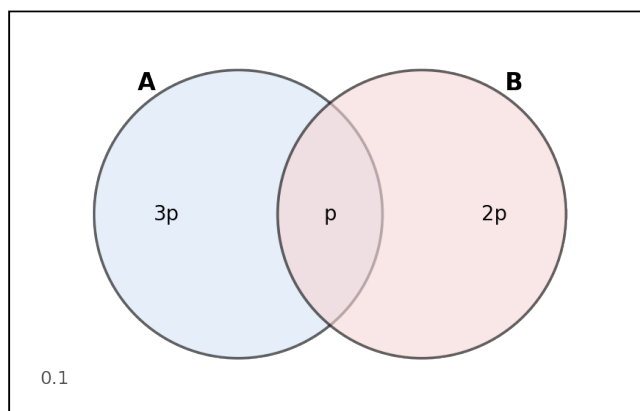
(2 marks)

Total for question = 3 marks



Question 6

The Venn diagram below shows events A and B and their associated probabilities, where p is a probability.



(a) Find the value of p .

(2 marks)

(b) Find

$$P(A \mid B)$$

(2 marks)

(c) Determine whether A and B are independent. Show your reasoning clearly.

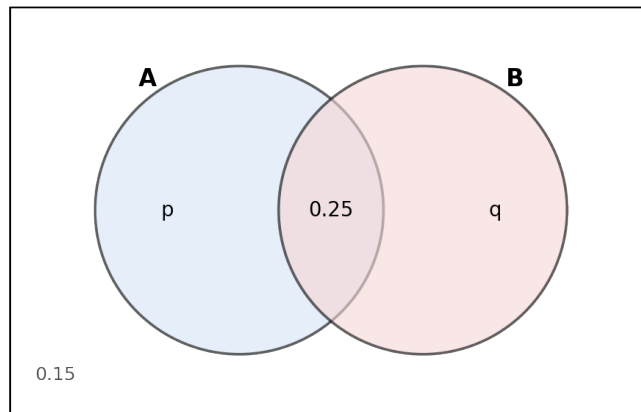
(2 marks)

Total for question = 6 marks



Question 7

The Venn diagram below shows events A and B and their associated probabilities, where p and q are probabilities.



Given that $P(A) = P(B)$,

(a) find the value of p and the value of q,

(3 marks)

(b) find

$$P(A' \mid B)$$

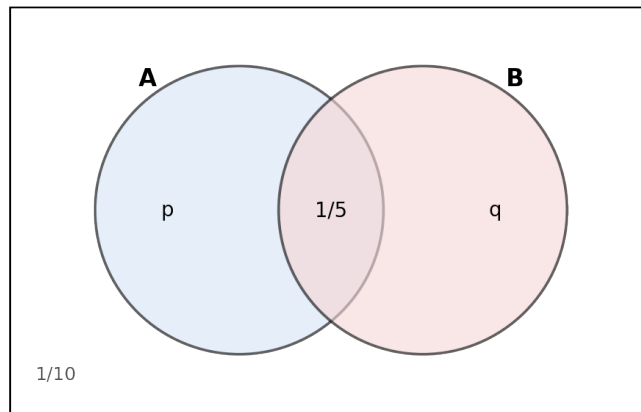
(2 marks)

Total for question = 5 marks



Question 8

The Venn diagram below shows events A and B and their associated probabilities, where p and q are probabilities.



Given that $P(B) = 2P(A)$,

(a) show that p and q satisfy the equations

$$p + q = \frac{7}{10} \quad q - 2p = \frac{1}{5}$$

(2 marks)

(b) Hence find the value of p and the value of q,

(3 marks)

(c) determine whether A and B are independent.

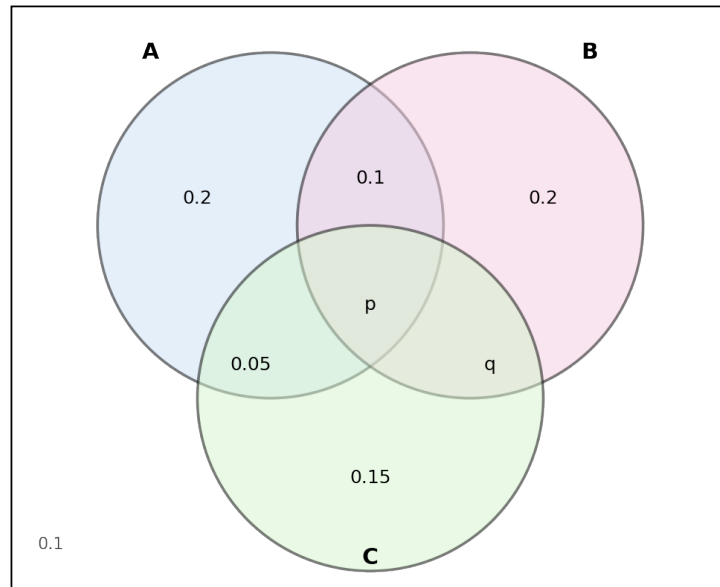
(2 marks)

Total for question = 7 marks



Question 9

The Venn diagram below shows events A, B and C and their associated probabilities, where p and q are probabilities.



Given that B and C are independent,

(a) show that $p + q = 0.20$,

(2 marks)

(b) given also that $P(A \cap B \cap C) = 0.04$, find the value of p and the value of q,

(2 marks)

(c) find

$$P(A \cup B \cup C)$$

(1 marks)

Total for question = 5 marks



Question 10

Three events A, B and C have the following probabilities:

$$P(A) = 0.5 \quad P(B) = 0.4 \quad P(C) = 0.3 \quad P(A \cap B) = 0.2 \quad P(A \cap C) = 0.1 \quad P(B \cap C) = 0.15 \quad P(A \cap B \cap C) = 0.05$$

(a) Draw a Venn diagram and fill in all eight regions.

(4 marks)

(b) Find

$$P(A \cup B \cup C)$$

(1 marks)

(c) Find

$$P(A \mid B \cap C)$$

(2 marks)

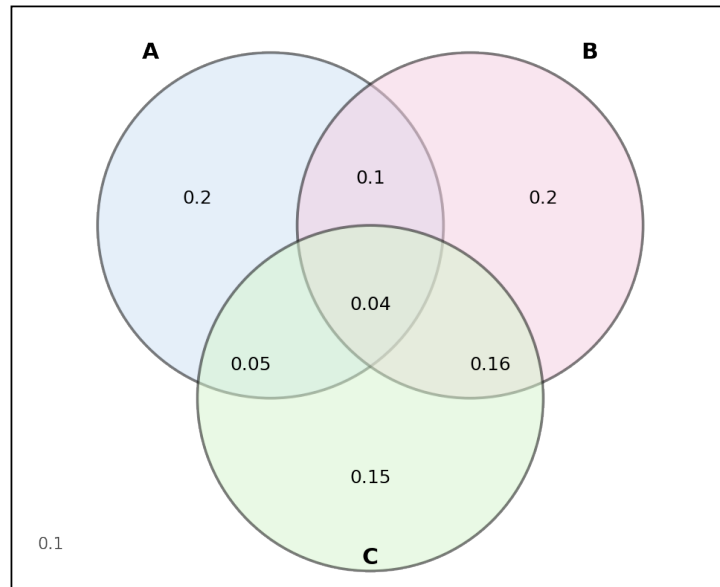
Total for question = 7 marks





Question 11

The Venn diagram below shows events A, B and C and their associated probabilities from Question 9.



The event D is such that

- A and D are mutually exclusive
- $P(B \cap D) > 0$

(a) On the Venn diagram, draw a circle to show a possible position for event D.

(1 marks)

Given that $P(D) = 0.1$,

(b) find

$$P(D' \mid B)$$

(3 marks)

Total for question = 4 marks



Question 12

Events A and B are such that

$$P(A \cap B) = 0.12 \quad P(B) = 0.3 \quad P(A) = 0.4$$

(a) Find

$$P(A | B)$$

(2 marks)

(b) Determine whether A and B are independent. Show your reasoning.

(2 marks)

Total for question = 4 marks



Question 13

Events A and B are independent, with

$$P(A) = 0.5 \quad P(B) = 0.6 \quad P(A \cap B) = 0.3$$

Show that A and B are independent.

(2 marks)

Total for question = 2 marks



Question 14

Events A and B are independent. Given that

$$P(A) = 0.4 \quad P(A \cup B) = 0.7$$

Find $P(B)$.

(4 marks)

Total for question = 4 marks



Question 15

Events A and B are independent. Given that

$$P(A \cap B') = 0.3 \quad P(A' \cap B) = 0.2$$

Find $P(A)$ and $P(B)$.

(5 marks)

Total for question = 5 marks



Question 16

A bag contains 3 red balls and 5 blue balls. Two balls are drawn at random without replacement.

(a) Draw a tree diagram to show all possible outcomes.

(3 marks)

(b) Find the probability that both balls are the same colour.

(3 marks)

Total for question = 6 marks





Question 17

On any given day, the probability that it rains is 0.3. When it rains, the probability that a student is late to school is 0.6. When it does not rain, the probability that the student is late is 0.1.

(a) Draw a tree diagram to represent this information.

(3 marks)

(b) Find the probability that the student is late.

(2 marks)

(c) Given that the student is late, find the probability that it was raining.

(3 marks)

Total for question = 8 marks



Question 18

A biased coin has probability 0.6 of landing on heads. The coin is flipped three times.

(a) Find the probability of obtaining exactly two heads.

(3 marks)

(b) Find the probability of obtaining at least one tail.

(2 marks)

Total for question = 5 marks