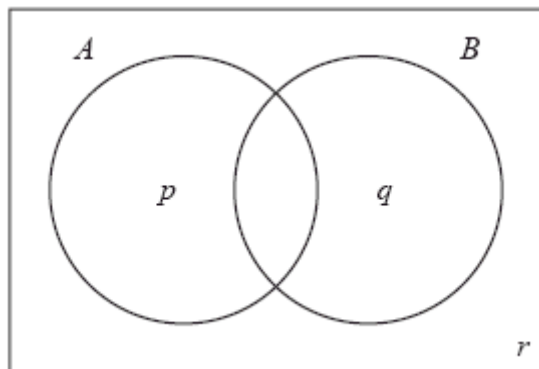


1. Consider the events A and B , where $P(A) = 0.5$, $P(B) = 0.7$ and $P(A \cap B) = 0.3$.

The Venn diagram below shows the events A and B , and the probabilities p , q and r .



- (a) Write down the value of

(i) p ;

(ii) q ;

(iii) r .

(3)

- (b) Find the value of $P(A | B')$.

(2)

- (c) Hence, or otherwise, show that the events A and B are **not** independent.

(1)

(Total 6 marks)

2. In a class, 40 students take chemistry only, 30 take physics only, 20 take both chemistry and physics, and 60 take neither.

(a) Find the probability that a student takes physics given that the student takes chemistry.

(b) Find the probability that a student takes physics given that the student does **not** take chemistry.

(c) State whether the events “taking chemistry” and “taking physics” are mutually exclusive, independent, or neither. Justify your answer.

(Total 6 marks)

3. In a class of 100 boys, 55 boys play football and 75 boys play rugby. Each boy must play at least one sport from football and rugby.
- (a) (i) Find the number of boys who play both sports.
(ii) Write down the number of boys who play only rugby. (3)
- (b) One boy is selected at random.
- (i) Find the probability that he plays only one sport.
(ii) Given that the boy selected plays only one sport, find the probability that he plays rugby. (4)

Let A be the event that a boy plays football and B be the event that a boy plays rugby.

- (c) Explain why A and B are **not** mutually exclusive. (2)
- (d) Show that A and B are **not** independent. (3)
- (Total 12 marks)**

4. For events A and B , the probabilities are $P(A) = \frac{3}{11}$, $P(B) = \frac{4}{11}$.

Calculate the value of $P(A \cap B)$ if

- (a) $P(A \cup B) = \frac{6}{11}$;
(b) events A and B are independent.

(Total 6 marks)

5. Let A and B be events such that $P(A) = \frac{1}{2}$, $P(B) = \frac{3}{4}$ and $P(A \cup B) = \frac{7}{8}$.

- (a) Calculate $P(A \cap B)$.
(b) Calculate $P(A|B)$.
(c) Are the events A and B independent? Give a reason for your answer.

(Total 6 marks)

6. Let A and B be independent events, where $P(A) = 0.6$ and $P(B) = x$.

(a) Write down an expression for $P(A \cap B)$.

(1)

(b) Given that $P(A \cup B) = 0.8$,

(i) find x ;

(ii) find $P(A \cap B)$.

(4)

(c) **Hence**, explain why A and B are **not** mutually exclusive.

(1)

(Total 6 marks)

7. Consider the independent events A and B . Given that $P(B) = 2P(A)$, and $P(A \cup B) = 0.52$, find $P(B)$.

(Total 7 marks)

8. The events A and B are independent such that $P(B) = 3P(A)$ and $P(A \cup B) = 0.68$. Find $P(B)$

(Total 6 marks)