

Probability - basics 2 (preDP2) [26 marks]

1. [Maximum mark: 6] 22M.2.SL.TZ1.6

Let A and B be two independent events such that $P(A \cap B) = 0.16$ and $P(A \cap B) = 0.36$.

(a) Given that $P(A \cap B) = x$, find the value of x . [4]

(b) Find $P(A|B)$. [2]

2. [Maximum mark: 6] 22M.2.SL.TZ2.4

Events A and B are independent and $P(A) = 3P(B)$.

Given that $P(A \cup B) = 0.68$, find $P(B)$. [6]

3. [Maximum mark: 8]

21M.2.SL.TZ2.4

At a school, 70% of the students play a sport and 20% of the students are involved in theatre. 18% of the students do neither activity.

A student is selected at random.

(a) Find the probability that the student plays a sport and is involved in theatre. [2]

(b) Find the probability that the student is involved in theatre, but does not play a sport. [2]

At the school 48% of the students are girls, and 25% of the girls are involved in theatre.

A student is selected at random. Let G be the event “the student is a girl” and let T be the event “the student is involved in theatre”.

(c) Find $P(G \cap T)$. [2]

(d) Determine if the events G and T are independent. Justify your answer. [2]

4. [Maximum mark: 6]

18N.1.AHL.TZ0.H_1

Consider two events, A and B , such that $P(A) = P(A' \cap B) = 0.4$ and $P(A \cap B) = 0.1$.

(a) By drawing a Venn diagram, or otherwise, find $P(A \cup B)$. [3]

(b) Show that the events A and B are not independent. [3]