

Question 1**(25 marks)**

The events A and B are such that $P(A) = 0.7$, $P(B) = 0.5$ and $P(A \cap B) = 0.3$.

(a) Find $P(A \cup B)$

$$\begin{aligned}
 P(A \cup B) &= P(A) + P(B) - P(A \cap B) \\
 &= 0.7 + 0.5 - 0.3 \\
 &= 0.9
 \end{aligned}$$

(b) Find $P(A|B)$

$$P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{0.3}{0.5} = 0.6$$

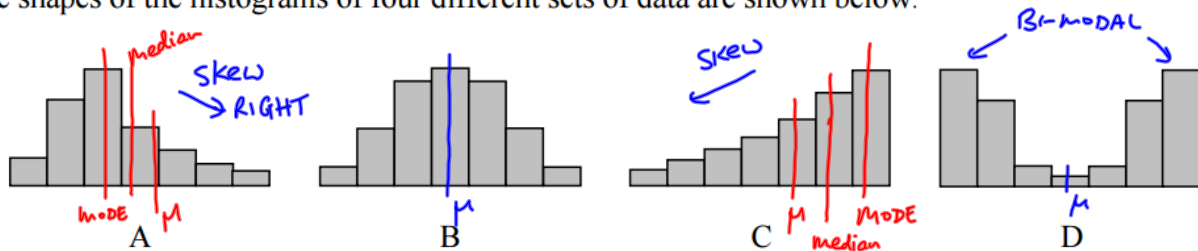
(c) State whether A and B are independent events, and justify your answer.

Since $P(A|B) \neq P(A)$ i.e. $0.6 \neq 0.7$
 $\Rightarrow A$ is affected by B happening
 \Rightarrow the events are not independent.

Question 2

(25 marks)

The shapes of the histograms of four different sets of data are shown below.



- (a) Complete the table below, indicating whether the statement is correct (✓) or incorrect (✗) with respect to each data set.

	A	B	C	D
The data are skewed to the left			✓	
The data are skewed to the right	✓			
The mean is equal to the median		✓		✓
The mean is greater than the median	✓			
There is a single mode	✓	✓	✓	

- (b) Assume that the four histograms are drawn on the same scale. State which of them has the largest standard deviation, and justify your answer.

Answer: D

Justification:

greatest spread from mean