A-Level Starter Activity

Jotnwa Maths

Topic: Probability Notation

Chapter Reference: Statistics 2, Chapter 2

8 minutes

1. For the events A and B,

$P(A \cap B') = 0.32$
$P(A' \cap B) = 0.11$
$P(A \cup B) = 0.65$

a. Draw a Venn diagram to illustrate the complete sample space for the events A and B. **(4)**

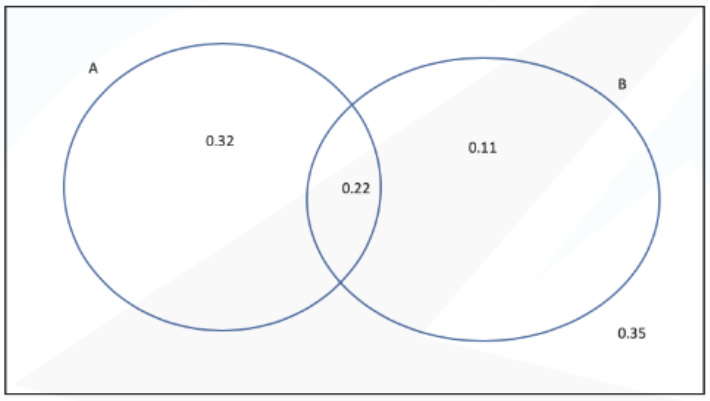
b. Write down the value of $P(A)$ and the value of $P(B)$ **(2)**

c. Find $P(A \mid B')$ **(3)**

d. Determine whether or not A and B are independent **(4)**

Solutions

1a.



Two intersecting circles AND box	**M1**
0.32, 0.11	**M1**
0.22	**M1**
0.35 outside	**M1**

1b.

P(A) = 0.33 + 0.22 P(A) = 0.54	**M1**
P(B) = 0.11 + 0.22 P(B) = 0.33	**M1**

1c.

P(B') = 1 – 0.33 P(B') = 0.67	**M1**
P(A n B') = 0.32	**M1**
P(A I B') = $\frac{0.32}{0.67}$ P(A I B') = $\frac{32}{67}$	**M1**

1d.

P(A) = 0.54 P(B) = 0.33 P(A n B) = 0.54 x 0.33 = 0.178	**M1**
From Venn, P(A n B) = 0.22	**M1**
If independent P(A) x P(B) = P(A n B) 0.22 ≠ 0.178	**M1**
Therefore, A and B are not independent.	**M1**