Test - Conditional probability

Year: Year 11 · Duration: 45 minutes · /20

Name:	Date:	**Mark: /20**

Question	1	2	3	4	5	Total
marks	4	4	4	4	4	**20**
Mark						

Show your working.

Question 1 (4 marks)

Question 1 – Two-way table (Higher)

80 students were asked if they like a new canteen menu.

	Likes	Does not like
Boys	22	18
Girls	26	14

a. Find $P(\text{girl} \mid \text{likes})$. (2 marks)
b. Find $P(\text{likes} \mid \text{boy})$. (2 marks)

Question 2 (4 marks)

Question 2 – Tree diagram (Higher)

A bag has 4 green and 6 yellow beads. Two beads are taken without replacement.

a. Find the probability that they are the same colour. (3 marks)
b. Given that the first is yellow, find the probability that the second is green. (1 mark)

Question 3 (4 marks)

Question 3 – Formula (Higher)

$P(A) = 0.6$, $P(B) = 0.5$ and $P(A \cap B) = 0.35$.

a. Find $P(A \mid B)$. (2 marks)
b. Are A and B independent? Show your working. (2 marks)

Question 4 (4 marks)

Question 4 – Backwards probability (Higher)

The probability of rain is 0.25. If it rains, the probability that a bus is late is 0.3. If it does not rain, the probability that the bus is late is 0.1.

a. Find the probability that the bus is late. (2 marks)
b. The bus is late. Find the probability that it rained. (2 marks)

Question 5 (4 marks)

Question 5 – Problem: how many blue counters? (Higher)

A bag has 4 red counters and n blue counters. Two counters are taken at random without replacement. The probability that both are red is $\frac{1}{6}$.

a. Show that $n^2 + 7n - 60 = 0$. (2 marks)
b. Solve the equation to find n. (2 marks)