Test - Probability: sample spaces and Venn diagrams

Year: Year 9 · 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 – Probability basics

A bag contains 4 red counters, 5 blue counters and 1 green counter. One counter is taken at random.

a. Find $P(\text{blue})$. (1 mark)
b. Find $P(\text{not green})$. (1 mark)
c. Find $P(\text{red or green})$. (1 mark)
d. Find $P(\text{yellow})$. (1 mark)

Question 2 (4 marks)

Question 2 – Two dice

Two fair dice are rolled and the scores are added.

a. Find the probability that the total is 8. (2 marks)
b. Find the probability that the difference between the scores is 2. (2 marks)

Question 3 (4 marks)

Question 3 – Venn diagram

Of 30 pupils, 17 swim, 12 cycle and 5 do both.

a. Work out the number in each region of a Venn diagram. (2 marks)
b. Find the probability that a pupil does neither activity. (1 mark)
c. Find the probability that a pupil does at least one of the activities. (1 mark)

Question 4 (4 marks)

Question 4 – Problem: the spinner

A spinner has three colours. $P(\text{red}) = 0.2$, $P(\text{blue}) = 0.5$ and $P(\text{green}) = x$.

a. Find x. (1 mark)
b. Find $P(\text{not blue})$. (1 mark)
c. The spinner is spun 150 times. How many greens are expected? (1 mark)
d. Find $P(\text{red or green})$. (1 mark)

Question 5 (4 marks)

Question 5 – Problem: the fair game

At a fair, a player pays £1 to roll one die. If the die shows a 6 the player wins £5.

a. Find the probability of winning. (1 mark)
b. In 300 plays, how many wins are expected? (1 mark)
c. Find the money paid out as prizes. (1 mark)
d. Find the expected profit for the fair. (1 mark)