Unit 19 · Probability

HARDER PRACTICE QUESTIONS

Full marks 25

Write your answers on separate paper. Show your working: the sample space, the favorable outcomes, and the probability in its lowest terms.

1 With a Venn diagram [4]

Cards numbered 1 to 50 are shuffled and one is drawn at random. Find the probability that its number is

i. a multiple of 3 or a multiple of 5 (or both);
ii. neither a multiple of 3 nor a multiple of 5.

2 Find the unknown [3]

A bag has 5 red balls and some blue balls, all the same size. The probability of drawing a red ball is 1/3.

i. How many blue balls are there?
ii. 3 more red balls are put in. What is the probability of drawing a red ball now?

3 Is it possible? [2]

Give a reason.

i. A weather report says the probability of rain tomorrow is 0.7 and the probability of no rain is 0.4.
ii. Manoj works out the probability of an event as 5/4.

4 Two-digit numbers [3]

A two-digit number (10 to 99) is chosen at random. Find the probability that

i. its digits add up to 9;
ii. it is a perfect square.

5 Playing cards [3]

One card is drawn at random from a well-shuffled pack of 52. Find the probability that it is

i. a red face card (jack, queen or king);
ii. neither a heart nor a king.

6 An unequal spinner [3]

A spinner is a circle cut into three parts: red with an angle of 120° at the center, blue 90° and green 150°.

i. Find the probability of each color.
ii. In 60 spins, about how many times would you expect green?

7 Is the die unfair? [3]

Richa rolled a die 60 times and got a six 16 times.

i. Find the empirical probability of a six, and compare it with the theoretical probability.
ii. Does this show that the die is unfair? Explain.
iii. If the die is fair, about how many sixes would you expect in 6,000 rolls?

8 Think [2]

A coin has landed heads five times in a row. Reshma says: “Tails is more likely next time, to even things out.” Is she right?

9 Make your own [2]

Design a bag of red, blue and green balls, with as few balls as possible, so that $P(\text{red}) = 0.4$ and $P(\text{blue}) = 0.35$. Give $P(\text{green})$.