GCSE HIGHER · REVISION MAT 3

Fairness and expected outcomes

1 A fair coin and a fair dice are used.

Are 'head' and '6' equally likely? Explain.

2 A letter is chosen at random from MATHEMATICS.

Find P(M).

3 Explain why picking names from a hat is a random method.

4 A card numbered 1 to 10 is picked.

A prime wins £3.

It costs £1.50 to play. Is it fair?

5 A spinner has 4 equal sections, A, B, C and D.

Show that P(A) = 0.25.

6 A bag has 4 red and 6 green balls.

How many green balls must be added to make P(red) = $\frac{1}{5}$?

7 Ella flips 3 heads in a row and says a tail is now 'due'.

Explain her mistake.

8 Two fair spinners numbered 1 to 4 are spun and their scores added.

Which total is most likely? Find its probability.

Mr&Mrs MATHS

ANSWERS · REVISION MAT 3

Fairness and expected outcomes

1 No: P(head) = $\frac{1}{2}$, P(6) = $\frac{1}{6}$

2 $\frac{2}{11}$

3 Each name has the same chance of being picked.

4 Primes: 2, 3, 5, 7

Expected win 0.4 × 3 = £1.20

Not fair

5 $\frac{1}{4}$ = 0.25

6 $\frac{4}{10 + n} = \frac{1}{5}$

n = 10

7 Each flip is independent, so P(tail) is still $\frac{1}{2}$.

8 Total 5: (1, 4), (2, 3), (3, 2), (4, 1)

5, with probability $\frac{4}{16} = \frac{1}{4}$