GCSE HIGHER · REVISION MAT 5

Fairness and expected outcomes

1 A fair dice is rolled.

Find P(less than 3).

2 A day of the week is chosen at random.

Find P(it is a weekend day).

3 Explain what 'equally likely' means.

4 200 raffle tickets are sold at £1 each.

There is one prize of £150.

Find the expected loss per ticket.

5 Two fair coins are flipped.

Show that P(two heads) ≠ P(one head and one tail).

6 A bag has 2 red, 3 blue and 5 green balls.

How many blue balls must be added to make P(blue) = $\frac{1}{2}$?

7 Explain why simulations often use random numbers from a computer.

8 A game costs 30p.

A fair spinner numbered 1 to 10 is spun, winning 10p × the number.

Is it fair to the organiser?

Mr&Mrs MATHS

ANSWERS · REVISION MAT 5

Fairness and expected outcomes

1 $\frac{2}{6} = \frac{1}{3}$

2 $\frac{2}{7}$

3 Each outcome has the same probability.

4 Expected win $\frac{150}{200} = 75p$

25p per ticket

5 $P(HH) = \frac{1}{4}$

$P(HT \text{ or } TH) = \frac{1}{2}$

6 $\frac{3+n}{10+n} = \frac{1}{2}$

$n = 4$

7 They produce outcomes that are unpredictable and equally likely, like real chance.

8 Expected win $10 \times 5.5 = 55p$

No: players gain 25p per game on average.

Mr&Mrs MATHS