GCSE HIGHER · REVISION MAT 4

Fairness and expected outcomes

1 A spinner has 4 equal sections: 3 red and 1 blue.

Find P(blue).

2 A month is chosen at random.

Find P(its name begins with J).

3 A dice lands on 6 twenty times in 60 rolls.

Explain why this suggests the dice may be biased.

4 Two coins are flipped.

You win £1 for two heads and lose 40p otherwise.

Is the game fair?

5 Show that P(exactly one head) $= \frac{1}{2}$ when two fair coins are flipped.

6 A bag has red and blue counters.

P(red) $= \frac{3}{8}$ and there are 15 blue counters.

How many red counters are there?

7 Explain how a sample space diagram helps you check whether a game is fair.

8 Two dice are rolled.

A scores a point if the product is even; B if it is odd.

Is this fair? How could it be made fair?

Mr&Mrs MATHS

ANSWERS · REVISION MAT 4

Fairness and expected outcomes

1 $\frac{1}{4}$

2 January, June, July

$\frac{3}{12} = \frac{1}{4}$

3 **You would expect about 10 sixes; 20 is double.**

4 Expected:

$0.25 \times 1 - 0.75 \times 0.4 = -0.05$

Not fair: lose 5p per game on average.

5 HT, TH out of HH, HT, TH, TT

$\frac{2}{4} = \frac{1}{2}$

6 Blue is $\frac{5}{8}$ of the total: 24

9 red

7 **It shows all equally likely outcomes, so you can count each player's chances.**

8 P(even) = $\frac{27}{36} = \frac{3}{4}$

Not fair; give B 3 points for each win.

Mr&Mrs MATHS