GCSE HIGHER · REVISION MAT 2

Relative frequency and expected outcomes

1 A fair coin is flipped 300 times.

How many heads would you expect?

2 A spinner lands on 5 in 18 out of 120 spins.

Find the relative frequency of 5.

3 Which gives a better estimate of a probability: 20 trials or 500 trials?

Explain.

4 P(an item is faulty) = 0.02.

A factory makes 1500 items.

Each faulty item costs £3 to replace.

Find the expected cost.

5 A dice is rolled 120 times.

Score	1	2	3	4	5	6
Frequency	15	18	17	16	14	40

Show that the relative frequency of 6 is $\frac{1}{3}$.

6 A dice is rolled 120 times.

Score	1	2	3	4	5	6
Frequency	15	18	17	16	14	40

Is the dice fair? Explain.

7 Explain why an expected number, such as 12.5, need not be a whole number.

8 A game costs 50p.

Two dice are rolled; a total of 12 wins £10.

The game is played 360 times.

Find the organiser's expected profit.

Mr&Mrs MATHS

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Relative frequency and expected outcomes

1 **150**

2 $\frac{18}{120}$

0.15

3 **500 trials: more data makes the relative frequency more reliable.**

4 Expected faulty: 30

£90

5 $\frac{40}{120} = \frac{1}{3}$

6 Expected about 20 sixes; 40 is far more

Probably biased towards 6

7 **It is an average over many repeats, not an actual result.**

8 P(12) = $\frac{1}{36}$: 10 wins, £100 paid out

Takings £180

£80

Mr&Mrs MATHS