

Exercise 1.4

Q1 (i) $P(2) = \frac{1}{6} \times 900 = 150$

(ii) $P(6) = \frac{1}{6} \times 900 = 150$

(iii) $P(2 \text{ or } 6) = \frac{2}{6} = \frac{1}{3} \times 900 = 300$

Q2 (i) $P(\text{Red}) = \frac{4}{8} = \frac{1}{2}$

(ii) (a) Expected freq = $\frac{1}{2} \times 400 = 200$ times

(b) White = $\frac{3}{8} \Rightarrow \text{Exp freq} = \frac{3}{8} \times 400 = 150$ times

Q3 (i) rel freq of head = $\frac{34}{100} = \frac{17}{50}$

(ii) No, it is biased, higher chance of getting a tail.
 0.34 is well below expected value of 0.5 .

Q4 (i) (a) Exp $P(6) = \frac{60}{300} = \frac{1}{5}$

(b) Exp $P(2) = \frac{40}{300} = \frac{2}{15}$

(ii) (a) $P(6) = \frac{1}{6}$

(b) $P(2) = \frac{1}{6}$

(iii) No as 60 is well above expected value of 50 and 40 is below the expected value.

Q5 (i) Estimate \Rightarrow Rel freq = $\frac{154}{300} = \frac{77}{150}$

(ii) No as Red is ~~over~~ over $\frac{1}{2}$ and would expect each to be $\frac{1}{3}$ for spinner to be fair.

Q6 Expected freq for red = $\frac{1}{2}$ or 150 out of 300
Times.

\therefore Not fair as 120 is well below the expected 150.

Q7 (i) $x = 1 - (0.2 + 0.1 + 0.3 + 0.1 + 0.2)$

$$x = 1 - 0.9$$

$$x = 0.1$$

(ii) $P(\text{higher than 3}) = 0.6$

(iii) $P(6) = 0.2 \Rightarrow 0.2 \times 1000 = 200$ times.

Q8 $P(\text{Pemma Wins}) = \frac{2}{30} = \frac{1}{15}$
Use larger No of trials for best estimate.

Q9 $P(6) = \frac{165}{1000} = \frac{33}{200}$

Use the largest No of Trials for Best estimate.

Q10 (i) Bill as he did the most trials

(ii)

	0	1	2
580 spins	187	267	126

 Spinner is Biased towards 1.

(iii) $P(2) = \frac{126}{580} = \frac{63}{290}$

(iv) $P(0) = \frac{187}{580}$ 1000 times \Rightarrow Expect $\frac{187}{580} \times 1000 = 322$ Times

Q11 (i) $P(1) = \frac{2}{6} = \frac{1}{3}$

(ii) 1, 2, 2, 3, 3, 4.

No's 2 and 3 are approx Double the others.