

# TWO-STAGE PROBABILITY

## SKILLS QUESTIONS

Q1. Complete the table of tossing 2 coins.

	H	T
H		
T		

Q2. Complete the table of tossing 2 coins to answer the following:

What is the probability of tossing:

- (a) two tails
- (b) two heads

Q3. Three coins are tossed together. Use a tree diagram to work out the probability of:

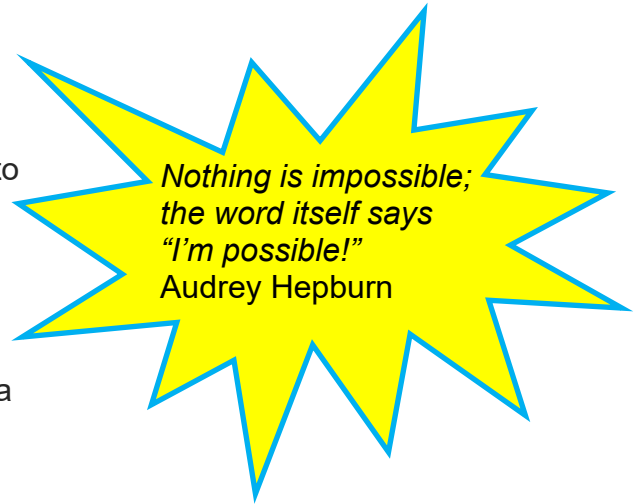
- (a) 3 heads
- (b) 3 tails
- (c) 1 tail
- (d) 2 heads
- (e) at least one head
- (f) at least 2 tails

Q4. Draw a tree diagram to show all the possible outcomes when 4 coins are tossed together. Then find the following probabilities. Use a calculator to write the answers as decimals rounded to 4 decimal places.

- (a) 4 heads
- (b) 4 tails
- (c) exactly 3 heads
- (d) exactly 1 tail
- (e) exactly 2 heads
- (f) exactly 2 tails
- (g) at least 2 heads

Q5. Draw a tree diagram to show all the possible 3 digit numbers that could be formed by using the digits 1, 2, and 3. Each digit can be used once only. Find the probability that the 3 digit number:

- (a) is even
- (b) ends in a 1
- (c) starts with a 2
- (d) ends in an 0.



Q6. The two-way table shows the outcomes when 2 dice are tossed.

		2 <sup>nd</sup> toss or 2 <sup>nd</sup> die					
		1	2	3	4	5	6
1 <sup>st</sup> toss or 1 <sup>st</sup> die	1						
	2						
	3						
	4						
	5						
	6						

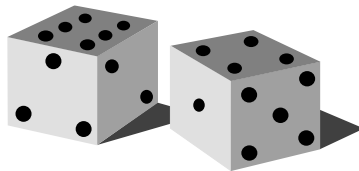
If 2 dice are tossed together, find the following probabilities. Use a calculator to write the answers as decimals rounded to 3 decimal places.

- (a) a total of 8
- (b) a total of 7
- (c) a total of 2
- (d) a total of 12
- (e) a 2 and a 3 in any order
- (f) a 2 on the 1<sup>st</sup> toss followed by a 3 on the 2<sup>nd</sup> toss
- (g) a total > 7
- (h) a total > 12
- (i) a total  $\leq$  7.

Q7. Here are the rules of the “Dice Differences Game”.

- Two players roll one die each.
- Player One wins if the difference between the die is 0, 1 or 2.
- Player Two wins if the difference is 3, 4 or 5.

Use probability concepts to analyse the “fairness” of the game.



# ANSWERS

Q1. HH, HT, TH, TT

Q2. (a)  $\frac{1}{4}$

(b)  $\frac{1}{2}$

Q3. (a)  $\frac{1}{8}$

(b)  $\frac{1}{8}$

(c)  $\frac{3}{8}$

(d)  $\frac{3}{8}$

(e)  $\frac{7}{8}$

(f)  $\frac{1}{2}$

Q4. (a) 0.0625

(b) 0.0625

(c) 0.25

(d) 0.25

(e) 0.375

(f) 0.375

(g) 0.6875

Q5. (a)  $\frac{1}{3}$

(b)  $\frac{1}{3}$

(c)  $\frac{1}{3}$

(d) 0

Q6. (a) 0.139

(b) 0.167

(c) 0.028

(d) 0.028

(e) 0.056

(f) 0.028

(g) 0.417

(h) 0

(i) 0.583