

B: Outcomes of Independent Events

Total Number of Outcomes

1. Count all outcomes shown in a sample space.
2. Multiply the number of possible outcomes for each event.

e.g. A coin is flipped ; a die is rolled.

$$\begin{aligned}\text{outcomes} &= \text{coin} \times \text{die} \\ &= 2 \times 6 \\ &= 12 \text{ possible outcomes}\end{aligned}$$

Examples:

1. A bag contains four letters: A, J, K, O. A spinner has two equal sections coloured Red and Green. A letter is chosen from the bag and the spinner is spun.

a) Display the sample space.

Letters	A	J	K	O
Spinner				
R	A,R	J,R	K,R	O,R
G	A,G	J,G	K,G	O,G

- b) How many possible outcomes does the sample space show?

→ Count them (middle section)

$$\text{outcomes} = 8$$

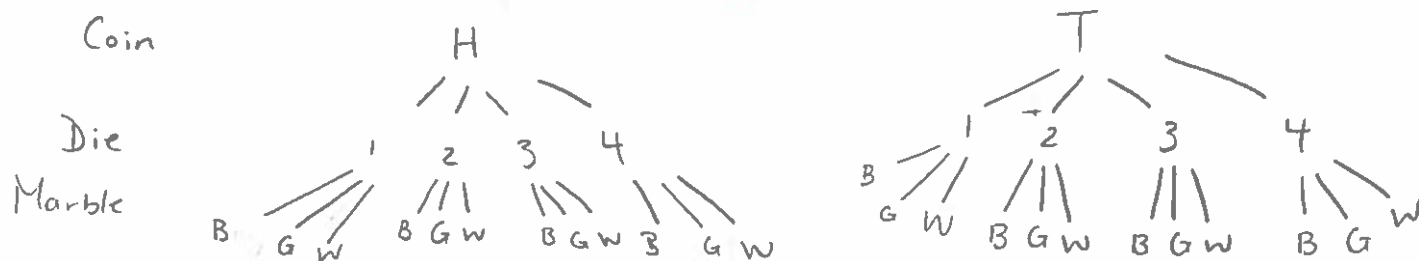
c) Check your answer to part (b).

$$\begin{aligned}\text{outcomes} &= \text{letters} \times \text{spinner} \\ &= 4 \times 2 \Rightarrow \# \text{ of outcomes for each event.} \\ &= 8\end{aligned}$$

2. A coin is flipped, a four-sided die is rolled, and a marble is randomly selected from a bag containing one black, one green and one white marble.

a) Show the sample space.

* Because there is more than 2 events happening you need to use a tree diagram!



b) How many possible outcomes are there?

* Count the last row of "branches".

$$\text{outcomes} = 24$$

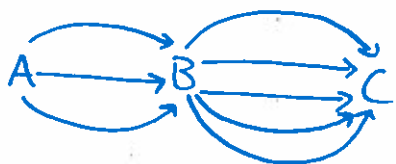
c) Verify the answer in (b).

$$\text{outcomes} = \text{coin} \times \text{die} \times \text{marble}$$

$$= 2 \times 4 \times 3 \rightarrow \# \text{ of possibilities for each outcome}$$

$$= 24$$

3. The diagram shows possible routes between three cities. How many possible routes from A to C?



$$\text{outcomes} = \text{A to B} \times \text{B to C}$$

$$= 3 \times 5$$

$$= 15$$

* Quicker than writing a sample space.

Assignment Pg. 423 #3-11, 13, 14a, 16.