

## Sample space

The set of all possible outcomes.

Eg. Rolling 2 dice and adding the scores together.

| + | 1 | 2 | 3 | 4  | 5  | 6  |
|---|---|---|---|----|----|----|
| 1 | 2 | 3 | 4 | 5  | 6  | 7  |
| 2 | 3 | 4 | 5 | 6  | 7  | 8  |
| 3 | 4 | 5 | 6 | 7  | 8  | 9  |
| 4 | 5 | 6 | 7 | 8  | 9  | 10 |
| 5 | 6 | 7 | 8 | 9  | 10 | 11 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 |



## Year 10 higher topic 10 Probability

What careers would use these skills?

Market research analyst, meteorologist, statistician, financial analyst, epidemiology, medical research.

## Definitions

**Mutually exclusive events** are events that can't happen at the same time.

**Independent events** one event doesn't influence another.

**Conditional probability** one event affects another and probabilities change.

**Exhaustive events** cover the entire

P (event wont happen)

$$= 1 - P(\text{event happens})$$

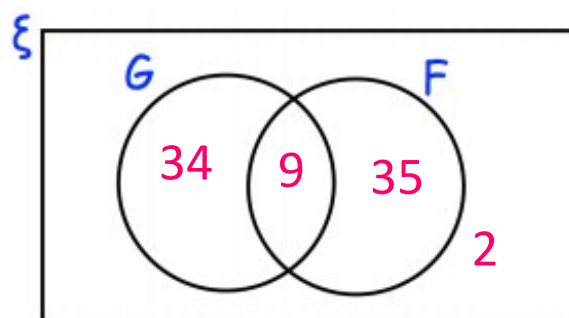
$P(A')$  refers to the probability that event A will not occur.

$P(A \cup B)$  refers to the probability that event A or B or both will occur.

$P(A \cap B)$  refers to the probability that both events A and B occur.

## Venn diagrams

A Venn Diagram shows the relationship between a group of different things and how they overlap. (You may be asked to shade Venn Diagrams as shown below)



Eg. There are 80 students in year 11. 9 students study French and German. 35 students only study French 2 students do not study French or German.

## Tree diagrams (basic)

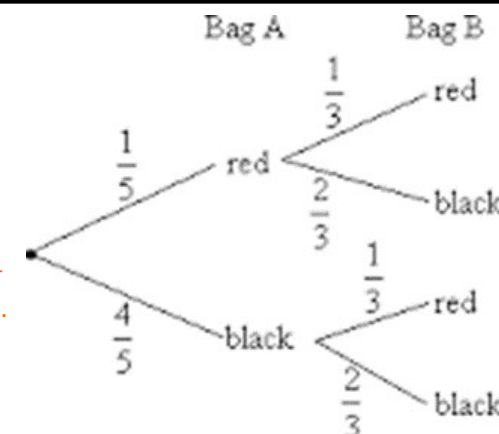
Tree diagrams show all the possible outcomes of an event and calculate their probabilities.

All branches must add up to 1 when adding downwards.

This is because the probability of something not happening is 1 minus the probability that it does happen.

Multiply going across a tree diagram.

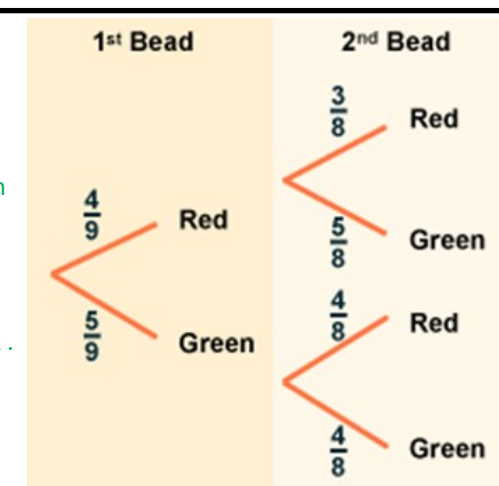
Add going down the tree diagram.



## Tree diagrams (conditional probability)

The probability of an event A happening, given that event B has already happened.

With conditional probability, check if the numbers on the second branches of a tree diagram changes. For example, if you have 4 red beads in a bag of 9 beads and pick a red bead on the first pick, then there will be 3 red beads left out of 8 beads on the second pick.



## Set theory

$(A \cup B)$  means 'A or B or both' (called Union)

$(A \cap B)$  means 'A and B' (called intersection)

