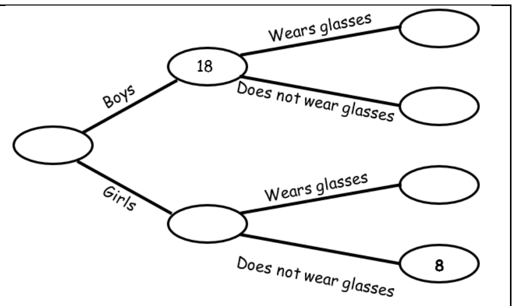
Listing outcomes of Multiple Events

<table>
<tr><td>Frequency Tree</td><td>A diagram showing how information is categorised into various categories.

The numbers at the ends of branches tells us how often something happened (frequency).

The lines connected the numbers are called branches.</td><td>
</td></tr>
<tr><td>Sample Space</td><td>The set of all possible outcomes of an experiment.</td><td>
<table>
<tr><td>+</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr>
<tr><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr>
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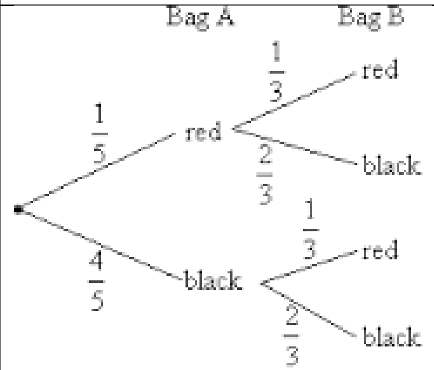
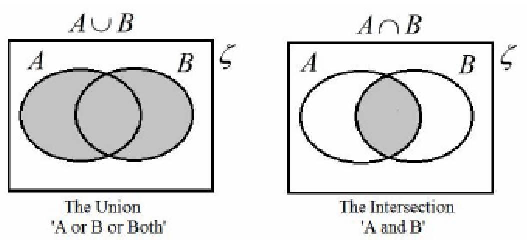
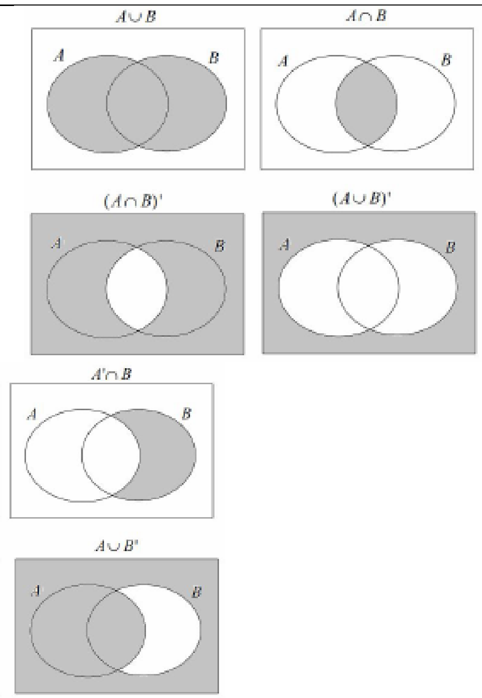
</table></td></tr>
<tr><td>Tree Diagrams</td><td>Tree diagrams show all the possible outcomes of an event and calculate their probabilities.

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 a tree diagram.</td><td>
</td></tr>
<tr><td>Venn Diagrams</td><td>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 and to the right.


</td><td>
</td></tr>
</table>

Finding Probabilities of Multiple Events

Independent Events	The outcome of a **previous event does not influence/affect the outcome of a second event.**	An example of independent events could be <u>replacing</u> a counter in a bag after picking it.
Dependent Events	The outcome of a **previous event does influence/affect the outcome of a second event.**	An example of dependent events could be not replacing a counter in a bag after picking it. '<u>Without replacement</u>'
Probability Notation	**P(A)** refers to the **probability that event A will occur**. **P(A')** refers to the **probability that event A will <u>not</u> occur**. **P(A ∪ B)** refers to the **probability that event A <u>or</u> B <u>or</u> both will occur.** **P(A ∩ B)** refers to the **probability that <u>both</u> events A and B will occur.**	P(Red Queen) refers to the probability of picking a Red Queen from a pack of cards. P(Blue') refers to the probability that you do not pick Blue. P(Blonde ∪ Right Handed) refers to the probability that you pick someone who is Blonde or Right Handed or both. P(Blonde ∩ Right Handed) refers to the probability that you pick someone who is both Blonde and Right Handed.
Venn Diagram Notation	∈ means '**element of a set**' (a value in the set) { } means the collection of values in the set. ξ means the '**universal set**' (all the values to consider in the question) **A' means 'not in set A' (called complement)** **A ∪ B means 'A or B or both' (called Union)** **A ∩ B means 'A and B (called Intersection)**	Set A is the even numbers less than 10. A = {2, 4, 6, 8} Set B is the prime numbers less than 10. B = {2, 3, 5, 7} A ∪ B = {2, 3, 4, 5, 6, 7, 8} A ∩ B = {2}
AND rule for Probability	When two events, A and B, are **independent**: $\boldsymbol{P(A\ and\ B) = P(A) \times P(B)}$	What is the probability of rolling a 4 and flipping a Tails? $P(4\ and\ Tails) = P(4) \times P(Tails)$ $= \frac{1}{6} \times \frac{1}{2} = \frac{1}{12}$
OR rule for Probability	When two events, A and B, are **mutually exclusive**: $\boldsymbol{P(A\ or\ B) = P(A) + P(B)}$	What is the probability of rolling a 2 or rolling a 5? $P(2\ or\ 5) = P(2) + P(5)$ $= \frac{1}{6} + \frac{1}{6} = \frac{2}{6} = \frac{1}{3}$