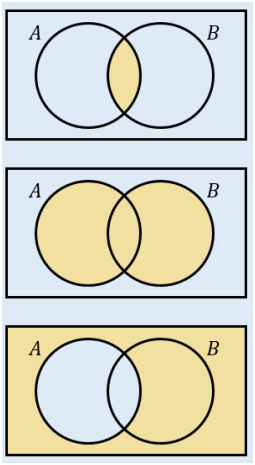
2A Set Notation



1. A card is selected at random from a standard pack of playing cards. Let A be the event that the card is an Ace, and D be the event that the card is a diamond.

a) Draw a Venn diagram to represent this information.

Find:

b) $P(A \cap D)$

c) $P(A \cup D)$

d) $P(A')$

e) $P(A' \cap D)$

2. Given that $P(A) = 0.3$, $P(B) = 0.4$ and $P(A \cap B) = 0.25$.

a) Explain why events A and B are not independent

b) Given also that $P(C) = 0.2$, events A and C are mutually exclusive, and events B and C are independent, draw a Venn diagram to represent the situation

c) Find $P\big((A \cap B') \cup C\big)$

2B Conditional Probability

1. A school has 75 students in year 12. Of these students, 25 study only humanities subjects (H), and 37 only study science subjects (S). 11 students study both types of subject.

a) Draw a two-way table to show this information

Find:

b) $P(S' \cap H')$

c) $P(S|H)$

d) $P(H|S')$

2. Two four sided dice are thrown together, and the sum of the numbers shown is recorded.

a) Draw a sample space diagram showing the possible outcomes

b) Given that at least one dice lands on a 3, find the probability that the sum of the two dice is exactly 5

c) State one modelling assumption used in your calculations

2C Conditional Probability in Venn Diagrams

1. A and B are two events such that $P(A) = 0.55$, $P(B) = 0.4$ and $P(A \cap B) = 0.15$.

a) Draw a Venn diagram showing the probabilities for events A and B.

Find:

b) $P(A|B)$

c) $P\big(B\big|(A \cup B)\big)$

d) $P(A'|B')$

2D Probability Formulae

1. A and B are two events, such that $P(A) = 0.6$, $P(B) = 0.7$ and $P(A \cup B) = 0.9$. Find $P(A \cap B)$.

2. C and D are two events such that $P(C) = 0.2$, $P(D) = 0.6$ and $P(C|D) = 0.3$.

   Find:

a) $P(C \cap D)$

b) $P(D|C)$

c) $P(C \cup D)$

2E Tree Diagrams

1. A bag contains 6 green beads and 4 yellow beads. A bead is taken from the bag at random, the colour is recorded and it is not replaced. A second bead is then taken from the bag and its colour recorded. Given that both balls are the same colour, find the probability that they are both yellow.