

Probability

1) A bag contains 5 red balls 4 white balls and 3 black balls. One is drawn from random and its colour is noted. Find;

- a) $P(\text{red})$ b) $P(\text{black})$ c) $P(\text{white or black})$
d) $P(\text{not white})$ e) $P(\text{orange})$

2) A card is taken at random from a standard pack of 52 playing cards. What is the probability that the card is:

- a) a seven b) a Diamond c) not a Spade
d) a red King e) a King, Queen or Jack f) a black Jack?

3) $P(\text{Boris wins}) = 0.35$, find $P(\text{Boris doesn't win})$

4) When a ball is chosen from a bag, $P(\text{red}) = 0.2$, $P(\text{orange}) = 0.35$
Find $P(\text{red or orange})$

5) We counted the number of colours of 200 different cars that passed:

Black	Silver	Red	White
50	80	10	60

- a) Find the relative frequency that the next car passing is silver
b) There are 10,000 cars in Ripon, estimate the number of red cars that there would be
c) Suggest a way to improve the accuracy of the probability you found in (a)
- 6) On any given winter day $P(\text{snow}) = 0.02$, in 350 days of winter, estimate the number of days in which it will be snowing.
- 7) In a class there are 12 girls and 15 boys. Pupils are chosen at random to win a selection of prizes. If 18 prizes are given out, estimate the number that will be won by boys
- 8) A card is drawn at random from a pack of cards.
By using the additive probability law, find the probability that is is either a king or a heart.
- 9) $P(A) = 0.3$, $P(B) = 0.4$, $P(A \text{ or } B) = 0.55$.
Find $P(A \text{ and } B)$

Sets

- 10) $\xi = \{1,2,3,4,5,6\}$ $A = \{1,2,3,4,5\}$ $B = \{2,4,6\}$ $C = \{\text{multiples of 3}\}$

List the following sets:

- a) $A \cap B$ b) C' c) $B' \cup C$ d) $A' \cap B \cap C$

- 11) In a class there are 28 pupils. 16 are wearing a jumper, 7 wear glasses and 8 wear neither. How many pupils are wearing both?
- 12) 4 pupils (Abel, Ben, Cara, Dana) are all scheduled for 4 different interview times (8,9,10,11). Using a logic table and the statements below, find out which time each pupil is scheduled for:

Abel is two hours later than Cara

Ben has an interview at 9.

Dana had her interview at some point before Abel

- 13) Draw a Venn Diagram and shade the following regions

- 2 ring a) $A' \cap B$ b) B' c) $A' \cup B'$
3 ring a) $A \cap B$ b) $A' \cup B$ c) $A' \cap B \cap C'$

Ans

- 1a) $5/12$ b) $1/4$ c) $7/12$ d) $2/3$ e) 0 2a) $1/13$ b) $1/4$ c) $3/4$ d) $1/26$ e) $3/13$ f) $1/26$ 3) 0.65
4) 0.55 5a) 0.4 b) 500 c) increase the number of cars in experiment 6) 7 7) 10 8) $\frac{4}{13}$
9) 0.15 10a) 2,4 b) 1,2,4,5 c) 1,3,5,6 d) 6 11) 3 12) A11, B9, C8, D10