# ***Probability***

Q1. Adam, Bashir and Clem take a mathematics test. The probability that Adam passes is 0.6, the probability that Bashir passes is 0.9, and the probability that Clem passes is 0.7. What is the probability of each of these outcomes?

**a** all three pass _____

**b** Bashir and Adam pass but Clem does not _____

**c** all three fail _____

**d** at least one passes _____

Q2. A bag contains 4 red and 6 blue balls. A ball is taken out and replaced. Another ball is taken out.

What is the probability of each of these?

**a** both balls are red _____

**b** both balls are blue _____

**c** at least one is red _____

Q3. A dice is thrown three times. What is the probability of

**i** 3 sixes? _____

**ii** no sixes? _____

**iii** at least one six? _____

Q4.A dice is thrown four times. What is the probability of

**i** 4 sixes? _____

**ii** no sixes? _____

**iii** at least one six? _____

Q5.A dice is thrown five times. What is the probability of

**i** 5 sixes? _____

**ii** no sixes? _____

**iii** at least one six? _____

Q6.A dice is thrown *n* times. What is the probability of

**i** *n* sixes? _____

**ii** no sixes? _____

**iii** at least one six? _____

Q7. A coin is tossed and a dice is thrown. What is the probability of getting a head on the coin and a four on the dice?

_____

Q8.Two dice are thrown.
**a)** What is the highest score that may be obtained when the two individual scores are added together?

**b)** What is the probability of this score being obtained when two dice are thrown?

**c)** What is the probability that at least one of the scores is at least five?

Q9.At a school fete, a car can be won by paying £1 and then throwing six normal dice and obtaining six sixes. To make sure there is no cheating, each throw has to be recorded on video.

**a)** What is the probability of winning the car for each £1 spent?

**b)** The car manufacturer takes the car and the game to a number of schools in turn until someone wins it. When it is won, it starts again with another car.
If everything works according to the probabilities and expectancy, how much profit would be made for schools for each car won, if each car is worth £15 000 ?

Q10. Some cards in a pack of playing cards have been lost, so now there are 10 hearts, 12 diamonds, 13 spades and 8 clubs.
A card is drawn from this incomplete pack at random. Draw a tree diagram to show the probabilities of obtaining each of the four suits if one card is drawn at random.

Q11.A bag contains five yellow balls and three green ones. A ball is drawn at random and replaced. The bag is then shaken and a second ball is drawn. Use a tree diagram to find the probability of obtaining one green ball and one yellow ball.

Q12.Repeat question **Q11** for the situation in which the first ball is not returned to the bag before the second ball is chosen.

Q13.A spinner similar to that in question **15** is made, but with the following colours and angles: Green 120° Red 90° Orange 60° Mauve 90°
The spinner is spun twice. Find the probabilities of the following pairs of results:

**a)** The colour green followed by the colour mauve.

_____

**b)** The colour red and the colour orange in either order.

_____

**c)** Not orange followed by not orange.

_____

Q14.A coin is tossed and a dice is thrown. Using a tree diagram and appropriate calculations, find the probability of getting a tail on the coin and a number greater than 4 on the dice.

_____

Q15.Joseph is taking exams in Maths, English and History. He has a 0.8 probability of passing Maths, a 0.6 probability of passing English and a 0.3 probability of passing History.
Draw a tree diagram to show these probabilities.

**a)** What is the probability he will pass all three? _____

**b)** What is the probability he will fail all three? _____

**c)** What is the probability he will pass Maths and English and fail History?

_____

**d)** What is the probability he will pass just any two of the exams and fail the third?

_____

Q16.The medical centre in a large factory keeps a record of accidents happening in the factory. When the statistics are analyzed, they reveal that the probability of a serious accident happening on any given day is 0.02, but this falls to 0.015 for the two or three days immediately following an accident. This is thought to be due to the fact that people are more careful for a short while after an accident.
Draw a tree diagram showing the probabilities of accidents happening/not happening for two consecutive days following a period of no accidents and answer the following questions.
**a)** What is the probability of two consecutive days with no serious accidents?

_____

**b)** What is the probability of there being no serious accidents on the first day and a serious accident on the second day?

_____

**c)** What is the probability of there being a serious accident on both days?

_____