**6A Discreet Random Variables (DRVs)**

1. Three fair coins are tossed.
2. Write down all the possible outcomes when the three coins are tossed.

A random variable, , is defined as the number of heads when the three coins are tossed.

1. Write the probability distribution of as:
2. A table
3. A probability mass function
4. A biased four sided dice with faces numbered 1, 2, 3 and 4 is rolled. The number on the bottom face is modelled as a random variable .

Given that

1. Find the value of
2. Give the probability distribution of in table form.
3. Find the Probability that:
4. The spinner below is spun until it lands on red, or has been spun 4 times in total. Find the probability distribution of the random variable , the number of times the spinner is spun.

**6B The Binomial Distribution**

1. Gary is playing chess against Nigel, and has a chance of winning each game.
2. If they play 5 games, what is the probability of Gary winning exactly 3?
3. Find the term containing in the following expansion:
4. If the probability of Gary winning a chess match is , find the probability of him winning exactly 3 games out of 5
5. Give the probability distribution of in table form.

Notes:

1. Gary is playing chess against Nigel, and has a chance of winning each game. If they play 5 games, what is the probability of Gary winning exactly 3?
2. The random variable . Find:
3. The probability that a randomly chosen member of a reading group is left-handed is 0.15. A random sample of 20 members of the group is taken.
4. Suggest a suitable model for the random variable , the number of members in the sample who are left handed. Justify your choice.
5. Use your model to calculate the probability that:
6. Exactly 7 sample members are left handed
7. Less than two members are left-handed

**6C Cumulative Probabilities on The Binomial Distribution**

1. The random variable . Find:
2. A spinner is designed so that the probability it lands on red is 0.3. Jane has 12 spins. Find the probability that Jane obtains:
3. No more than 2 reds
4. At least 5 reds
5. Jane decides to use this spinner for a class competition. She wants the probability of winning a prize to be less than 0.05. Each member of the class has 12 spins and the number of reds is recorded.

Find how many reds should be needed to win a prize