

**MDM4U      Quiz – Probability Distribution – Discrete Variables**

1. A game involves rolling a die. A player who rolls an even number receives points equal to double the face value of the die. If the player rolls an odd number, the player loses triple the face value of the die.
  - a) Determine the expected value. [3]
  - b) Is this a fair game? Explain. [2]
  
2. In an archery competition, Paul hits the bull's eye 65% of the time.
  - a) Show the probability distribution for the number of bull's-eyes in three attempts. [2]
  - b) What would be the expected number of bull's eyes in ten attempts? [2]
  
3. A factory produces computer chips with a 0.9% defect rate. In a batch of 100 computer chips, what is the probability that
  - a) Only 1 is defective? [2]
  - b) At least 3 are defective? [3]

4. A top NHL hockey player scores on 93% of his shots in a shooting competition.

a) What is the probability that the player will not miss the goal until his 10<sup>th</sup> try? [2]

b) What is the expected number of shots before he misses? [2]

5. A bag contains 3 blue, 6 green and 5 red jellybeans. Four jellybeans are selected at random, one at a time, without replacement.

a) Show the probability distribution for the number of green jellybeans selected. [4]

b) What is the expected number of green jellybeans that would be selected? [2]

6. A raffle is being held by the local hockey league. The first prize is \$5 000, there are two second prizes of \$1 000 each and ten prizes of \$20 each. If 5000 tickets are sold, how much should they charge per ticket so the league ends up raising a good amount of money to use for the league. Show your calculations, including the expected payout per ticket, and give an explanation for your final answer.

[4]