|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Description: Description: EGC_Black | | Mathematics Essentials 2016  Unit 3/4 Test 4  Task Weighting: 6% | | |
| Student Name: |  | |  |

Time Allowed: **55 Minutes** Total Marks: **48**

**Calculators and files are allowed in this test.**

***Answer all of the following questions. Show all working where appropriate to maximise marks.***

**Question 1 (2 Marks)**

Express the probability of the following situation using the appropriate method shown.

Choosing a blue jellybean from a jar containing 7 red, 5 green and 4 blue jellybeans

1. Word \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Fraction\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Decimal\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Percentage\_\_\_\_\_\_\_\_\_\_\_\_\_

**Question 2 (2 Marks)**

Provide a real life example/situation where probability is used to make a decision or decisions.

**Question 3 (2 Marks)**

The probability of Les being late for school on any morning is . Les has 56 school days left until he finishes school. On approximately how many days will Les be late for school?

**Question 4 (6 Marks: 3, 3)**

A dice game is played between 2 players. Each player rolls a dice and the winner is decided as follows; Player A wins if 1, 2, 3 or 4 is the highest number rolled. Player B wins if 5 or 6 is the highest number rolled

1. Complete the following sample space to display all possible outcomes for the game.

**PLAYER A**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **1** | **2** | **3** | **4** | **5** | **6** |
| **1** |  |  |  |  |  |  |
| **2**  **PLAYER**  **B** |  |  |  |  |  |  |
| **3** |  |  |  |  |  |  |
| **4** |  |  |  |  |  |  |
| **5** |  |  |  |  |  |  |
| **6** |  |  |  |  |  |  |

1. Which Player has the higher probability of winning? Justify with calculations

**Question 5 (2 Marks)**

Tomorrow’s weather forecast includes the statements: The probability of strong winds is 70%. The chance of rain is . Which event, strong winds or rain is more likely to occur? Justify with calculations.

**Question 6 (5 Marks: 2, 1, 2)**

1. If a 6-sided die was rolled 10 times how many times would you expect the number 4 to be rolled?
2. After 10 rolls the number 4 came up 5 times. Display as a percentage
3. If the dice was rolled a further 90 times would you expect this percentage to increase or decrease? Explain your answer

**Question 7 (8 Marks: 2, 1, 1, 4)**

In basketball a player can shoot one of 3 shots; a 2 pointer (worth 2 points), a 3 pointer (worth 3 points) or a Free Throw (worth 1 point). A player’s shooting percentage is the probability of making that shot.

If a basketballer has a 2-Point field goal percentage of 46%, a 3-Point field goal percentage of 30% and a Free Throw percentage of 80%. Calculate:

1. How many Free Throws would you expect to be successful from 56 shots?
2. How many 2-Pointers would you expect to be successful from 21 shots?
3. How many 3-Pointers would you expect to be successful if 15 were shot?
4. If the basketballer had 10 of the same shot to get the most points possible, based on the shooting percentages, which is the better option, Free Throws, 2-Pointers or 3-Pointers?

**Question 8 (5 Marks)**

Harrison **ALWAYS** orders from the following items when he eats at McDonalds; a Big Mac or a Quarter Pounder to start, then either a Chocolate, Caramel or Strawberry Mega Choc Waffle Cone and finally either a Coke or Fanta to wash it down.

If Harrison goes to McDonalds twice a week for 3 weeks how many Chocolate Mega Choc Waffle Cones would you expect Harrison to eat? Justify by creating a tree diagram to demonstrate the sample space.

**Question 9 (7 Marks: 2, 2, 2, 1)**

This game is based on tennis but uses a coin and a six-sided die. There are two players, A and B. A serves by tossing a coin. If the outcome is heads (H) the service is good; if tails (T) there is a fault and that player is allowed to serve again. Only two services are allowed. H or TH gives a good service; TT gives a double fault, and B wins the point.

If the service is good, B rolls the die.

If the outcome is 1, 2, 3, or 4 then it is a good stroke; if 5 or 6 then the point is lost.

If the stroke is good then A rolls the die. This continues until the point is lost.

**Pete is playing Mark in a game of Rainy Day Tennis.**

a) Pete is serving. He tosses the coin and gets a head. He then tosses the coin again and gets another head. Mark says that Pete is playing the game incorrectly. Explain why.

b) The following results of tossing the coin and rolling the die were recorded for a game:

T H 3 1 4 2 6

Explain who won, given that Pete served. Explain your answer

c) If neither player had a coin, but they had the die, explain a method that could be used to play the game so that it is basically the same as in the rules.

d) State one factor that may cause this simulation to no longer model the real world event.

**Question 10 (9 Marks: 3, 3, 3)**

Kalgoorlie has a Latitude and Longitude of 30.8˚ S and 121.5˚ E. Find the distance between Kalgoorlie and the following places (Use the Earth’s radius as 6370 km):

1. Hualien County, Taiwan (23.9˚ N, 121.5˚ E)
2. Coast of Antarctica (65.5˚ S, 121.5˚ E)
3. Use the map provided to estimate the distance between Esperance and Lagrange in the northwest of the state. Show all working to allow your answer to be checked.

(Use the Earth’s radius as 6370 km)

**END OF TEST**