|  |  |  |
| --- | --- | --- |
| Name:  Class: | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Date:\_\_\_\_\_\_\_\_\_\_ |
|  | **Year 12 Essential Mathematics**  **Test 6 – Probability: Expected Values** | / 38  5% |

Q1) A regular deck of cards is 52 cards. These are split into suits of 13. Each suite has the numbers 2-10, then face cards called jacks, queens, kings and aces. Use this information to solve the following problems. [1,1,2 = 4 marks]

1. What is the chance of drawing an ace from the deck?
2. What is the chance of drawing the aces of spades?
3. What is the probability of drawing a face card or a 5?

Q2) Jarruh has a handful of M&M’s, consisting of 3 red, 4 blue and 3 green. Laureece has 16 M&M’s, having 5 red, 8 blue and 3 green. [1,2 = 3 marks]

1. Who has a better chance of eating the green M&M next?
2. Who has the better chance of not eating a Green? How can you tell?

Q3) Sugarloaf rock in Dunsborough is a famous hike and climb people often do, however, in winter this can be dangerous. Of the 92 days in winter, its usually rains 22 days and is okay to climb the rest, unless there is hightide. [1,2 = 3 marks]

1. What is the probability, that on any given day, it will be raining?
2. If you drove to sugar loaf rock on a clear day( not raining), what is the probability you could climb it, given that there is a 10% chance of a hightide that day?

Q4) A builder offers three roof colours, and 3 interior wall colours. The roofs can be Red (R), Mauve (M) or Cyan (C), and the interior can be Navy(N), Yellow(Y) or Pink(P). [ 3, 1, 2 = 6 marks]

1. List all of the colour combinations available.
2. What is the chance someone will get a Mauve roof with yellow walls?
3. What is the probability they will pick Navy, if they have already chosen the Red roof?

Q5) When going to subway, Sam either gets the steak sub, or the meatball subs. He then chooses to get either honey oat or Italian herb and cheese. Lastly, he chooses to get a cookie, brownie or a drink. [4, 1, 1 , 2 = 8 marks]

1. Represent his choices and list the outcomes
2. What is the chance he picks the steak and bacon?
3. What is the chance he picks the cookies?
4. What is the probability that Sam would pick a cookie to go with his honey oat sub?

Q6) Nick and Ben go to Ascot Race Course and bet on horse races. The favourite horse has won 3 out of every 5 times it has raced. Given that the horse has run in 35 races, how many times has it lost?

[2 marks]

Q7) Amber and Jenny play scratch tickets. Amber knows she has a 1 in 8 chance of winning.

1. If she buys 24 tickets, how many should she win on? [2,2 = 4 marks]
2. Amber won on 6 of the tickets, is this reasonable or not?

Q8) Influenza effects about 26.3 million people annually. Of these people, about 30% are hospitalised, and of those people, about 7% do not recover. [2, 4 = 6 marks]

1. If the Flu shot is administered to someone with influenza, they have a 1/10 chance of not getting better. Given that 26.3 million people had the flu, how many people, if given the flu shot, could be made better?
2. How many people would not recover from influenza?

Q9) Shaun says that because there is a 9 in 20 chance of it raining, it is unlikely, where as Erin says that it is almost an even chance, who is more correct and why? [2 marks]