**QQQ – GCSE – Probability**

1. The probability that Bob eats a burger today is 0.3. The probability that his wife Bobette eats a burger today is 0.6. The probability that they both eat a burger is 0.2. Are the events of Bob and Bobette eating burgers independent? Give a reason.  
     
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2. The table shows the probability of each outcome on an unfair 4-sided spinner.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Outcome: |  |  |  |  |
| Probability: |  |  |  |  |

I spin the spinner 200 times. How many times do I expect to see a 4?  
  
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1. I spin two 3-sided spinners, each with the numbers 1, 2 and 3 on them. I multiply the numbers from the two spinners.
   1. Draw a sample space diagram to indicate the possible outcomes.  
        
        
        
        
        
        
        
        
      (2 marks)
   2. Use your sample space diagram to calculate the probability that the product of the two numbers is prime (note that 1 is not a prime number).  
        
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2. Bart and Bertie go to see a movie. The probability that Bart enjoys the movie is 0.6. The probability that Bertie enjoys the movie is 0.3. These two events are independent.
   1. What’s the probability they both enjoy the movie?  
        
      \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1 mark)
   2. What’s the probability that exactly one of them enjoys the movie?  
        
      \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
        
      \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (3 marks)
3. Here are seven tiles.



Jim takes at random a tile.

He does **not** replace the tile.

Jim then takes at random a second tile.

(a) Calculate the probability that both the tiles Jim takes have the number 1 on them.

..............................................

**(2)**

(b) Calculate the probability that the number on the second tile Jim takes is greater than the number on the first tile he takes.

..............................................

**(3)**

1. Let be the event that I did my homework and the event that I get a detention next lesson.  
   The probability that I do my homework is 0.8. The probability I get a detention next lesson if I do my homework is 0.05, and 0.9 if I didn’t.
   1. Use this information to complete the probability tree: (1 mark)
   2. Use your tree to work out the probability that I get a detention next lesson. (2)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
        
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**Awards: 15/21 Bronze, 17/21 Silver, 19/21 Gold, 21/21 Platinum**

**Answers**

1. No (1 mark), because if they were independent, then the probability of both eating a burger would be . (1 mark)
2. Determines that (1mark). Does some multiplication of with their probability (1 method mark). Answer of . (1 mark)
3. a) 1 mark for construction of 2D table with 1, 2, 3 marked across top row and leftmost column. 1 mark for correct values.

|  |  |  |  |
| --- | --- | --- | --- |
|  | 1 | 2 | 3 |
| 1 | 1 | 2 | 3 |
| 2 | 2 | 4 | 6 |
| 3 | 3 | 6 | 9 |

b) 2 marks for correct answer of .

1. a) .  
   b)   
    3 marks for fully correct answer.  
    2 marks if one numerical error.  
    1 mark for presence of either or .
2. a) (1 method mark, 1 accuracy mark)  
   b) (3 marks)
3. a) 1 mark for all correct probabilities.

b)   
 (1 mark for method, 1 for correct answer)

**Total marks: 21 (15 for Bronze, 17 for Silver, 19 for Gold)**