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| Year  9 | | Mathematics Test  Counting Techniques and Relative Frequencies | | Non Calculator |
| Short Answer Section | Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
|  | Write all working and answers in the spaces provided on this test paper. | | | |
| **Questions 1 – 3 refer to the following**. A bag holds one red, one blue and one yellow ball. Agnetha will choose a ball, replace it and then choose another ball. She draws up the tree diagram below to work out the sample space. | | | | |
| 1. | . Complete the sample space from the tree diagram. | | | |
| 2. | What is the probability that Agnetha chooses the same colour ball both times?  ..........................................................................................................................................................    .......................................................................................................................................................... | | | |
| 3. | What is the probability that neither of the balls chosen is red?  ..........................................................................................................................................................    .......................................................................................................................................................... | | | |
| **Questions 4 and 5 refer to the following.** Kayla counts the number of people wearing various club colours in the crowd at a double header football match and records the results in the table.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Club colours | Tigers | Saints | Mariners | Bombers | No Colours | | Number of People. | 650 | 550 | 500 | 450 | 350 | | | | | |
| 4. | If one person were chosen at random from the crowd, what is the probability that they are wearing Saints colours?  .......................................................................................................................................................... | | | |
| 5. | If one person were chosen at random from those wearing club colours, what is the probability that they are wearing Bombers or Mariners colours?  .......................................................................................................................................................... | | | |
| **Questions 6 – 8 refer to the following.** In a board game, two dice are rolled, and the sum of their faces is taken as the players score for the round. Caroline has begun to draw up a table to show the sample space. | | | | |
| 6. | Complete the table for the sample space.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Total | 1 | 2 | 3 | 4 | 5 | 6 | | 1 | 2 | 3 |  |  |  |  | | 2 | 3 |  |  |  |  |  | | 3 | 4 |  |  |  |  |  | | 4 |  |  |  |  |  |  | | 5 |  |  |  |  |  |  | | 6 |  |  |  |  |  |  | | | | |
| 7. | On a given round, what is the probability that Caroline’s score will be 7?  ..........................................................................................................................................................    .......................................................................................................................................................... | | | |
| 8. | On a given round, what is the probability that Caroline’s score will be 6 or less?  ..........................................................................................................................................................    .......................................................................................................................................................... | | | |
| **Questions 9 – 11 refer to the following.** Ross places his name and the names of his brother Hector and his two sisters Karen and Zoe into a hat and draws out two names to see who will use the two tickets his parents won to a concert. | | | | |
| 9. | Complete the tree diagram and list the sample space. | | | |
| 10. | What is the probability that Ross and Karen will get the tickets.  ..........................................................................................................................................................    .......................................................................................................................................................... | | | |
| 11. | What is the probability that two siblings of the same gender will get the tickets?  ..........................................................................................................................................................    .......................................................................................................................................................... | | | |

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| Year  9 | | Mathematics Test  Counting Techniques and Relative Frequencies | | Calculator Allowed |
| Multiple Choice Section | Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
|  | Mark all your answers on the accompanying multiple choice answer sheet, not on this test paper. You may do any working out on this test paper. Calculators are allowed for this section. | | | |
| 1. | A game show has four teams which compete each week, with one team winning the weekly prize. Their results over the last 25 weeks are shown.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Team | Crocs | Skinks | Goannas | Frillnecks | | Number of Wins | 4 | 8 | 7 | 6 |   What is the probability that the Crocs will win the 26th game?  A.  B.  C.  D. | | | |
| 2. | Which section A, B, C or D on the Venn diagram represents “Red haired cricketers who don’t play the guitar”? | | | |
| 3. | The two-way table compares pet ownership from a sample of 40 people.   |  |  |  |  | | --- | --- | --- | --- | |  | Male | Female | Total | | Has a pet | 12 | 16 | 28 | | Doesn’t have a pet. | 8 | 4 | 12 | | Total | 20 | 20 | 40 |   If one person were chosen at random from the sample, what is the probability that they were a female who has a pet?  A.  B.  C.  D. | | | |
| **Questions 4 and 5 refer to the following**.  The Venn diagram at right shows the subject likes of 30 students in the class 9S.  A student is chosen at random from the 9S students. | | | | |
| 4. | What is the probability that the student likes Maths?  A.  B.  C.  D. | | | |
| 5. | What is the probability that the student likes History but not Maths?  A.  B.  C.  D. | | | |
| **Questions 6 – 8 refer to the following**.  When going to work, Kayla chooses a top and pants from her wardrobe.  On a particular morning it was dark in her bedroom and she randomly chose a top and pants.  The tree diagram shows her possible choices. | | | | |
| 6. | What is the probability that she chooses a T shirt and Jeans?  A.  B.  C.  D. | | | |
| 7. | What is the probability that she chooses a top and pants of the same colour?  A.  B.  C.  D. | | | |
| 8. | What is the probability that she chooses a top and pants that are different colours?  A.  B.  C.  D. | | | |
| **Questions 9 – 11 refer to the following**.  In a game Mario draws two marbles from a bag containing two red, one white and one blue marble.  The tree diagram shows the possible combinations he could draw. | | | | |
| 9. | What is the probability that the marbles are both red?  A.  B.  C.  D. | | | |
| 10. | What is the probability that only one of the marbles is red?  A.  B.  C.  D. | | | |
| 11. | What is the probability that neither marble is red?  A.  B.  C.  D. | | | |

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| Year  9 | | | Longer Questions  Counting Techniques and Relative Frequencies | | Calculator Allowed. |
|  | Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
|  | Write all working and answers in the spaces provided on this test paper.  Calculators are allowed for this section. | | | | |
| 1. | The Venn diagram at right shows three characteristics of the 80 students in year 9 at a school. | | | | |
|  | (a)  1 mark | How many students read science fiction and play sport, but do not listen to music?  .......................................................................................................................................  ....................................................................................................................................... | | | |
| (b)  2 marks | A student is chosen at random from the year 9 students. What is the probability that the student listens to music and plays sport?  .......................................................................................................................................  ....................................................................................................................................... | | | |
| (c)  2 marks | A student is chosen at random from the students who read science fiction. What is the probability that the student also listens to music and plays sport?  .......................................................................................................................................  ....................................................................................................................................... | | | |

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| 2. | Jimmy plays a game where he tosses a pair of four-sided dice, the first numbered 1 – 4 and the second numbered 6 – 9. The numbers are then written side by side to make a 2 digit number. | |
|  | a)  2 marks | Complete the table to show the sample space.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | 1 | 2 | 3 | 4 | | 6 | 16 |  |  |  | | 7 |  |  |  |  | | 8 |  |  |  |  | | 9 |  |  |  |  | |
| b)  1 mark | What is the probability that the two digit number is greater than 25?  .......................................................................................................................................  ....................................................................................................................................... |
| (c)  1 mark | What is the probability that the two digit number is divisible by 3?  .......................................................................................................................................  ....................................................................................................................................... |
| 3. | Martina places five cards numbered 1, 2, 4, 6 and 8 in a bag. She draws two cards out and multiplies the numbers together. | |
|  | (a)  2 marks | Complete the tree diagram to show the sample space. |
| (b)  1 mark | What is the probability that the product is greater than 25?  .......................................................................................................................................  ....................................................................................................................................... |
| (c)  1 mark | What is the probability that the product is an even number?  .......................................................................................................................................  ....................................................................................................................................... |

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| Year  9 | Mathematics Test  Counting Techniques and Relative Frequencies | |  |
| Multiple Choice  Answer Sheet | Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |

Completely fill the response oval representing the most correct answer.

1. A B C D

2. A B C D

3. A B C D

4. A B C D

5. A B C D

6. A B C D

7. A B C D

8. A B C D

9. A B C D

10. A B C D

11. A B C D

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|  | Mathematics Test  Counting Techniques and Relative Frequencies |
| Answer Sheet |

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| Short Answer | |
| 1 | RR,RB, RY, BR, BB, BY, YR, YB, YY. |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Total | 1 | 2 | 3 | 4 | 5 | 6 | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | 5 | 6 | 7 | 8 | 9 | 10 | 11 | | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| 7 |  |
| 8 |  |
| 9 | RK, RH, RZ, KR, KH, KZ, ZR, ZK, ZH, HR, HK, HZ |
| 10 |  |
| 11 |  |

|  |  |
| --- | --- |
| Multiple Choice | |
| 1 | A |
| 2 | A |
| 3 | C |
| 4 | C |
| 5 | A |
| 6 | C |
| 7 | D |
| 8 | D |
| 9 | B |
| 10 | D |
| 11 | B |

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| Longer Answer | | |
|  |  | 6 Students |
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|  |  | |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | 1 | 2 | 3 | 4 | | 6 | 16 | 26 | 36 | 46 | | 7 | 17 | 27 | 37 | 47 | | 8 | 18 | 28 | 38 | 48 | | 9 | 19 | 29 | 39 | 49 | |
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|  |  |  |
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|  |  | Sample Space  2, 4, 6, 8, 2, 8,12, 16, 4, 8, 24, 32, 6, 12, 24, 48, 8, 16, 32, 48 |
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