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| MC900229237[1] ACE Examinations  2016  **YEAR 10**  **YEARLY EXAMINATION** | | Student Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Mathematics | | |
| **General Instructions**   * Reading time - 5 minutes * Working time - 90 minutes * Write using black or blue pen * You may use a pencil to draw or complete diagrams * Calculators may be used | **Total marks - 60**  **Section 1**  **25 marks**  Attempt Questions 1-25  Allow 35 minutes for this section  **Section 2**  **35 marks**  This section has two parts  Part A - Questions 26-30 25 marks  Part B - Questions 31-32 (advanced) 10 marks  Allow 55 minutes for this section | |

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| Section 1 |
|  |
| 25 marks |
| Attempt Questions 1 - 25 |
| Allow about 35 minutes for this section |
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| Use the multiple-choice answer sheet for Questions 1-25 |
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|  | | | |
|  | (A) | | |
|  | (B) | | |
|  | (C) | | |
|  | (D) | | |
|  | | | |
| 1. If a fair dice lands on a 1, then a 3, what is it most likely to land on next? | | | |
|  | | (A) not a 1 | |
|  | | (B) not a 3 | |
|  | | (C) a 6 | |
|  | | (D) any number | |
|  | | | |
| 1. The table below shows the results of a test. | | | |
| |  |  | | --- | --- | | Score | Frequency | | 3 | 9 | | 4 | 5 | | 5 | 2 | | 6 | 2 | | 7 | 1 | | | | |
| What is the median of this data? | | | |
|  | | (A) 3 | |
|  | | (B) 4 | |
|  | | (C) 5 | |
|  | | (D) 6 | |
|  | | | |
| 1. Which of the following expressions would correctly increase $18.50 by 20%? | | | |
|  | | (A) | (B) |
|  | | (C) | (D) |
|  | | | |

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| 1. How many 5 cm cubes can be packed in a box measuring 10 cm by 10 cm by 10 cm? | | | |
|  | | | |
|  | | | (A) 4 |
|  | | | (B) 8 |
|  | | | (C) 10 |
|  | | | (D) 16 |
|  | | | |
| 1. What is the gradient of a line given the equation *y* = 3*x* – 5? | | | |
|  | | (A) ‒5 | |
|  | | (B) ‒3 | |
|  | | (C) 3 | |
|  | | (D) 5 | |
|  | | | |
| 1. What is the length of the hypotenuse in ? Answer to the nearest whole number? | | | |
|  | | | |
|  | | (A) 11 | |
|  | | (B) 60 | |
|  | | (C) 61 | |
|  | | (D) 3721 | |
|  | | | |
| 1. What is the value of *x* if ? | | | |
|  | (A) 3 | | |
|  | (B) 7 | | |
|  | (C) 14 | | |
|  | (D) 28 | | |
|  | | | |
| 1. What is the value of *b* if ,  and ? | | | |
|  | | | (A) 2 |
|  | | | (B) 8 |
|  | | | (C) 22.7 |
|  | | | (D) 64 |

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| 1. What is the midpoint between  and ? | |
|  | (A) |
|  | (B) |
|  | (C) |
|  | (D) |
|  | |
| 1. The following two triangles are similar. | |
|  | |
| What is the value of *x*? | |
|  | (A) 6 |
|  | (B) 8 |
|  | (C) 14 |
|  | (D) 1 |
|  | |
| 1. What is the value of *x* in the right-triangle below? | |
|  | |
|  | (A) |
|  | (B) |
|  | (C) |
|  | (D) |
|  | |
| 1. Darcy is paid $19.20 per hour for 35 hours of casual work. Toby is paid the same rate and works the same hours as Darcy but works an additional 6 hours on Saturday and is paid time-and-a-half. How much extra money is Toby paid compared to Darcy? | |
|  | (A) $57.60 |
|  | (B) $114.75 |
|  | (C) $172.80 |
|  | (D) $288.00 |

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|  | |
|  | (A) |
|  | (B) |
|  | (C) |
|  | (D) |
|  | |
| 1. What is the value of *x*? | |
|  | |
|  | (A) 50 |
|  | (B) 100 |
|  | (C) 115 |
|  | (D) 130 |
|  | |
| 1. The cost of hiring a taxi (*C*) is given by the formula , where *d* is the distance travelled by the taxi in kilometres. What is the total cost per kilometre for travelling 4 km in the taxi? | |
|  | (A) $8 |
|  | (B) $17 |
|  | (C) $20 |
|  | (D) $32 |
|  | |
| 1. A standard deck of cards contains 52 cards, including two black kings. Julia selects a card at random from a standard pack. What is the probability that Julia does *not* select a black king? | |
|  | (A) |
|  | (B) |
|  | (C) |
|  | (D) |
|  | |

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| 1. The graph below shows the number of people living in each unit of an apartment block. | | |
|  | | |
| What is the probability of selecting a unit with two residents? | | |
|  | (A) | (B) |
|  | (C) | (D) |
|  | | |
| 1. A full-price air ticket costs $800. Oliver saved $200 off this price because he purchased the ticket early. What percentage discount did Oliver receive on the original price? | | |
|  | (A) 20 | |
|  | (B) 25 | |
|  | (C) 33.3 | |
|  | (D) 40 | |
|  | | |
| 1. Triangle *ABC* has sides of length 6, 8 and 10. | | |
|  | | |
| Which of these has the largest value? | | |
|  | (A) | |
|  | (B) | |
|  | (C) | |
|  | (D) | |
|  | | |

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| 1. The shaded region is formed by removing two circles the same size from a rectangle. | | |
|  | | |
| What is the area of the shaded region? | | |
|  | (A) | |
|  | (B) | |
|  | (C) | |
|  | (D) | |
|  | | |
| 1. Which of the following is an equivalent statement to ? | | |
|  | (A) | |
|  | (B) | |
|  | (C) | |
|  | (D) | |
|  | | |
| 1. Which of the following could describe the parabola drawn opposite? | |  |
|  | (A) |
|  | (B) |
|  | (C) |
|  | (D) |
|  | | |
| 1. A second-hand bookstore has 5 books on the table. The mode price of these books is $8, the median price is $6 and the books have a range in price of $5. Which of the following is the price of the cheapest book on the table? | | |
|  | (A) $1 | |
|  | (B) $2 | |
|  | (C) $3 | |
|  | (D) $4 | |
|  | | |

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| 1. The area of triangle *ABC* is 24 square units. | |
|  | |
| What is the length of *AB*? | |
|  | (A) 8.5 |
|  | (B) 8.9 |
|  | (C) 10 |
|  | (D) 13 |
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| Section 2 Part A |
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| 25 marks |
| Attempt Questions 26 ‒ 30 |
| Allow about 40 minutes for this section |
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| Answer the questions in the spaces provided. |
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| All necessary working should be shown in every question. |
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| **Question 26** | | | (5 marks) |  | **Marks** |
|  |  |  | | |  |
| (a) | A box contains eight apples, seven oranges and five bananas. If a piece of fruit is picked at random, what is the chance of getting: | | | |  |
|  | (i) | a banana. | | | **1** |
|  |  |  | | |  |
|  | (ii) | an apple or an orange. | | | **1** |
|  |  |  | | |  |
| (b) | Billie borrows $30,000 to buy a car and is charged 12% per annum simple interest. He pays off the loan in 5 years. How much interest does he pay? | | | | **1** |
|  |  | | | |  |
| (c) | The line *AB* has the equation . | | | |  |
|  | (i) | What is the gradient of the line *AB*? | | | **1** |
|  |  |  | | |  |
|  | (ii) | Find the equation of the line parallel to *AB* and passing through | | | **1** |
|  |  |  | | |  |

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| **Question 27** | | | (5 marks) |  | **Marks** |
|  |  |  | | |  |
| (a) | Simplify | | | | **1** |
|  |  | | | |  |
| (b) | *AC* is parallel to *DE*, and | | | |  |
|  |  | | | |  |
|  | (i) | Find the value of *x*. Give a reason for your answer. | | | **1** |
|  |  |  | | |  |
|  | (ii) | Find the value of *y*. Give a reason for your answer. | | | **1** |
|  |  |  | | |  |
| (c) | Solve these equations. | | | |  |
|  | (i) |  | | | **1** |
|  |  |  | | |  |
|  | (ii) |  | | | **1** |
|  |  |  | | |  |

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| **Question 28** | | | (5 marks) |  | **Marks** |
|  |  |  | | |  |
| (a) | A rectangular farmyard has a length of  metres and width of *x* metres. | | | |  |
|  |  | | | |  |
|  | (i) | Explain why the area (*A*) of the rectangle is given by: . | | | **1** |
|  |  |  | | |  |
|  | (ii) | Complete the following table. | | | **1** |
|  |  | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | *x* | 0 | 5 | 10 | 15 | 20 | | *A* |  |  |  |  |  | | | |  |
|  | (iii) | Draw the graph of *A* against the different values of *x*. | | | **1** |
|  |  | | | |  |
| (b) | Lucas earns $5200 gross a month. He has annual deductions of $20,100 in tax and $1664 in health insurance. What is his net monthly income? | | | | **1** |
|  |  | | | |  |
| (c) | Chloe pays a plumber $385, which includes a GST of 10%.  Calculate the amount of GST paid by Chloe. | | | | **1** |
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| **Question 29** | | | (5 marks) |  | **Marks** |
|  |  |  | | |  |
| (a) | A carton is made from this net. All measurements are in centimetres. | | | |  |
|  |  | | | |  |
|  | (i) | What is the volume of this carton? | | | **1** |
|  |  |  | | |  |
|  | (ii) | What is the surface area of this carton? | | | **1** |
|  |  |  | | |  |
| (b) | The dot plot shows that number of goals per game scored by Adam’s team. | | | |  |
|  | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | 0 | 1 | 2 | 3 | 4 | 5 | 6 |  | | **Number of goals per game** | | | | | | | | | | | |  |
|  | (i) | How many games did Adam’s team play? | | | **1** |
|  |  |  | | |  |
|  | (ii) | What was the average number of goals scored per game? | | | **1** |
|  |  |  | | |  |
|  | (iii) | What percentage of games did Adam’s team score 4 or more goals? | | | **1** |
|  |  |  | | |  |

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| **Question 30** | | | (5 marks) |  | **Marks** |
|  |  |  | | |  |
| (a) | Given  and . Prove that . | | | | **2** |
|  | HY 32b | | | |  |
|  |  | | | |  |
| (b) | Simplify | | | | **1** |
|  |  | | | |  |
| (c) | Molly is standing at the top of a vertical cliff. The cliff is 52 metres above sea level and she is 1.8 metres tall. Molly observes a ship out to sea with an angle of depression of 27˚. | | | | **2** |
|  | Ye 12c | | | |  |
|  | How far is the ship from the base of the cliff? Answer to the nearest metre. | | | |  |
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| Section 2 Part B: Advanced |
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| 10 marks |
| Attempt Questions 31 ‒ 32 |
| Allow about 15 minutes for this section |
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| Answer the questions in the spaces provided. |
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| All necessary working should be shown in every question. |
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| **Question 31** | | | (5 marks) |  | **Marks** |
|  |  |  | | |  |
| (a) | Interest of $900 was earned on an investment of $5000 over a period of 4 years. Calculate the annual flat rate of interest paid on the investment. | | | | **1** |
|  |  | | | |  |
| (b) | Find the value of *x* if . | | | | **1** |
|  |  | | | |  |
| (c) | Solve the equation | | | | **1** |
|  |  | | | |  |
| (d) | Find three consecutive positive integers if the sum of their squares is 50. | | | | **2** |
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| **Question 32** | | | (5 marks) |  | | | | **Marks** |
|  |  |  | | | | | |  |
| (a) | A stage forms part of a platform. All measurements are in metres. | | | | | | |  |
|  |  | | | | | | |  |
|  | (i) | Calculate the shaded area of the platform in terms of *x*. | | | | | | **2** |
|  |  |  | | | | | |  |
|  | (ii) | If the shaded area of the platform is equal to three times the area of the stage, determine the length represented by *x*. | | | | | | **1** |
|  |  |  | | | | | |  |
| (b) | Draw neat sketches of these equations. | | | | | | | **2** |
|  | (i) |  | | | | (ii) |  |  |
|  |  | | | |  | | |  |

**End of test**