

NAME: ……………………………………………………

TEACHER:  **IMO GON MCR PLU**

**St Aloysius’ College**

**Year 9**

**Yearly Examination**

**2017**

**MATHEMATICS (5.3 course)**

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| **General Instructions**  Reading time – 5 minutes  Working time – 1 hours  • Write using black pen only.  • Board approved calculators may be used  • All necessary working should be shown in every question in the spaces provided.  • Marks will be deducted for careless and poorly arranged work  • Examination papers must NOT be removed from the examination room. | **Total marks − 80**  Attempt all questions  **Section I – Multiple Choice (25 Marks)**  • All questions are of equal value  • Circle the correct answer on the separate  answer sheet  **Section II − Short answer (25 marks)**  **Section III − Working required (30 marks)** |
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| Section I |
|  |
| 25 marks |
| Attempt Questions 1 - 25 |
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| Use the multiple-choice answer sheet for Questions 1-25 |
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| 1. Which number is the larger? | | |
|  | (A) 0.036 | |
|  | (B) | |
|  | (C) | |
|  | (D) | |
|  | | |
| 1. What is the value of *x*, if ? | | |
|  | | (A) 6 |
|  | | (B) 8 |
|  | | (C) 14 |
|  | | (D) 27 |
|  | | |
| 1. Which of the following is the number 495,000,000 expressed in scientific notation? | | |
|  | | (A) |
|  | | (B) |
|  | | (C) |
|  | | (D) |
|  | | |
| 1. Which of the following will produce an even number if *x* = 3? | | |
|  | | (A) |
|  | | (B) |
|  | | (C) |
|  | | (D) |
|  | | |
| 1. What is the value of  if ? | | |
|  | | (A) 36º52’ |
|  | | (B) 36º87’ |
|  | | (C) 37º |
|  | | (D) 53º8’ |
|  | | |

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| 1. What is the probability of throwing two sixes if two dice are thrown? | |
|  | (A) |
|  | (B) |
|  | (C) |
|  | (D) |
| 1. Which graph is perpendicular to  : | |
|  | (A) |
|  | (B) |
|  | (C) |
|  | (D) none of these |
|  | |
| 1. What is the median of the numbers 6, 7, 4, 0, 2 and 6? | |
|  | (A) 2 |
|  | (B) 5 |
|  | (C) 6 |
|  | (D) 7 |
|  | |
| 1. A composite shape is made up of a rectangle and a semi-circle. | |
|  | |
| What is the perimeter of the shape, correct to two decimal places? | |
|  | (A) 11.14 m |
|  | (B) 13.14 m |
|  | (C) 14.28 m |
|  | (D) 16.28 m |
|  | |
| 1. What is the simple interest earned when $5000 is invested at 6% p.a. for 3 years? | |
|  | (A) $90 |
|  | (B) $100 |
|  | (C) $900 |
|  | (D) $1000 |

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| 1. Which number is three less than the number ? | |
|  | (A) |
|  | (B) |
|  | (C) |
|  | (D) |
|  | |
| 1. Hayley’s hourly rate of pay is $15.20 for the first 36 hours and time-and-a-half for every extra hour. How much is she paid for 45 hours of work? | |
|  | (A) $684.00 |
|  | (B) $752.40 |
|  | (C) $820.80 |
|  | (D) $1026.00 |
|  | |
| 1. What is the value of *x* (correct to one decimal place) in the triangle below? | |
|  | |
|  | (A) 4.2 cm |
|  | (B) 5.0 cm |
|  | (C) 5.4 cm |
|  | (D) 12.8 cm |
|  | |
| 1. is equal to: | |
|  | (A) |
|  | (B) |
|  | (C) |
|  | (D) |
|  | |
| 1. The line passes through which point? | |
|  | (A) (0, 0) |
|  | (B) (0, –1) |
|  | (C) (0, 1) |
|  | (D) (0, 2) |
|  | |

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| 1. What is the area (correct to the nearest square metre) of this shape? | |
|  | |
|  | (A) 24 cm2 |
|  | (B) 32 cm2 |
|  | (C) 38 cm2 |
|  | (D) 40 cm2 |
|  | |
| 1. When factorising a quadratic trinomial of the form we need to find 2 numbers which | |
|  | (A) multiply to give *b* and add to give *a* |
|  | (B) multiply to give *b* and add to give *c* |
|  | (C) multiply to give *c* and add to give *b* |
|  | (D) multiply to give *c* and add to give *a* |
|  | |
| 1. A rectangular prism is 10 cm long, 8 cm wide and 4 cm high.   What is the surface area of the rectangular prism? | |
|  | (A) 152 cm2 |
|  | (B) 304 cm2 |
|  | (C) 320 cm2 |
|  | (D) 640 cm2 |
|  | |
| 1. Which of the following is the correct factorisation of ? | |
|  | (A) |
|  | (B) |
|  | (C) |
|  | (D) |
|  | |
| 1. A printer is marked at $130 after being reduced by 30% in a one-day sale.   What was the original price of the printer? | |
|  | (A) $39.00 |
|  | (B) $91.00 |
|  | (C) $169.00 |
|  | (D) $185.71 |
|  | |

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| 1. Ryan and Ava have three daughters. Ava would like to have a son. If they have another baby, how likely is it to be a boy? | |
|  | (A) Unlikely, about 1 in 4. |
|  | (B) Quite likely, because four girls in a row is unlikely. |
|  | (C) Very likely, a probability of about |
|  | (D) Close to 50/50, a probability of about |
|  | |
| 1. In the diagram below the area of  is 20 square units. | |
|  | |
| What are the coordinates of *B*? | |
|  | (A) |
|  | (B) |
|  | (C) |
|  | (D) |
|  | |
| 1. What is the length of the hypotenuse? | |
|  | |
|  | (A) 13 units |
|  | (B) 15 units |
|  | (C)  units |
|  | (D)  units |
|  | |

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| 1. A sum of $8500 amounted to $8925 after being invested for 6 months at simple interest. What was the interest rate earned? | |
|  | (A) 8% p.a. |
|  | (B) 9% p.a. |
|  | (C) 10% p.a. |
|  | (D) 11% p.a. |
|  | |
| 1. Solve | |
|  | (A) |
|  | (B) |
|  | (C) |
|  | (D) |
|  | |

End of Section I

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| College Crest - Black  NAME: ……………………………………………………  TEACHER:  **IMO GON MCR PLU**  Section II 25 Marks |
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| Answer the questions in the spaces provided. |
| All necessary working should be shown in every question. |
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| **Question 1** | | | (5 marks) |  |  |
|  |  |  | | |  |
| (a) | Harry bought a pair of socks for $6.00. The next day the price had risen to $9.00.Find the percentage increase on the original price. | | | | **1** |
|  |  | | | |  |
| (b) | Factorise fully | | | | **1** |
|  |  | | | |  |
| (c) | Decrease 120 kg by 7.5% | | | | **1** |
|  |  | | | |  |
| (d) | Simplify | | | | **1** |
|  |  | | | |  |
| (e) | Simplify | | | | **1** |
|  |  | | | |  |

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| **Question 2** | | | (5 marks) |  | | |  |
|  |  |  | | | | |  |
| (a) | Simplify. | | | | | | **1** |
|  |  | | | | | |  |
| (b) | Max is a cyclist who can ride one lap of the oval in 45 seconds.How many laps will Max have completed after riding for 6 minutes at the same speed? | | | | | | **1** |
|  |  | | | | | |  |
| (c) | Find the area of the following shape. Answer to the nearest whole number. | | | | | | **2** |
|  |  |  | | |  |  |  |
|  |  | | | | | |  |
| (d) | Find Jordan’s net pay for the week if he earns $2060 but pays 35% of this in tax, pays 5% super, and his other deductions are $230.50 per week. | | | | | | **1** |
|  |  | | | | | |  |

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| **Question 3** | (5 marks) |  |  |
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1. Express  with a positive index. **1**

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| --- | --- | --- |
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(b) Write  without indices. **1**

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(c) Plot the graph of *y* = *x*2 – 2*x* – 3 for  showing all key features. **3**

*y*

*x*

*y*

0

*x*

|  |  |  |  |  |  |
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| **Question 4** | | | (5 marks) |  |  |
|  |  |  | | |  |
| (a) | A bag contains 7 blue cards, 2 yellow cards and 1 white card. One card is selected at random. What is the probability of NOT selecting a blue card? | | | | **1** |
|  |  | | | |  |
| (b) | Factorise . | | | | **1** |
|  |  | | | |  |
| (c) | *P* is the point (7, –3) and *Q* is the point (–1, 3). By plotting *P* and *Q*, or otherwise, | | | |  |
|  |  | | | |  |
|  | (i) | Find the distance from *P* to *Q*. | | | **1** |
|  |  |  | | |  |
|  | (ii) | Find the coordinates of the midpoint of *PQ*. | | | **1** |
|  |  |  | | |  |
|  | (iii) | Find the gradient of *PQ*. | | | **1** |
|  |  |  | | |  |

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| **Question 5** | | (5 marks) |  |  |
| A boat leaves port and travels 175 km on a bearing of 150. | | | |  |
| (a) | Draw a diagram showing all key information | | | **1** |
| (b) | How far south of the port is the boat, to the nearest kilometre? | | | **2** |
| (c) | What is the bearing of the port from the boat?  End of Section II | | | **2** |

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| College Crest - Black  NAME: ……………………………………………………  TEACHER:  **IMO GON MCR PLU**  Section III: Working required 30 marks | | | |
| Answer the questions in the spaces provided. | | | |
| All necessary working should be shown in every question. | | | |
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| (a) | After 7 tests Emily has a mean of 78%. What score would Emily need in the next test to increase the mean to 80%? | | **2** |
|  |  | |  |
| (b) | Calculate the amount of compound ***interest*** earned if $12,000 is invested for  6 years at 8 % p.a., compounded quarterly. (Answer to the nearest dollar) | | **2** |
|  |  | |  |
| (c) | Zoe has a box containing one blue marble and two red marbles. She selects two marbles at random. Find the probability of her selecting: | |  |
|  | (i) | two red marbles if she replaces the first marble before she selects the second marble. | **1** |
|  |  |  |  |
|  | (ii) | one blue marble if she does not replace the first marble. | **1** |
|  |  |  |  |
| (d) | A cylinder of height 18.5 cm has a volume of 1500 cm3. What is the length of the radius of the cylinder? Answer to the nearest centimetre. | | **2** |
|  |  | |  |
| (e) | Simplify . | | **3** |
|  |  | |  |
| (f) | Expand and simplify | | **2** |
| (g) | Expand and simplify | | **2** |

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| (h) | Describe the transformations that needs to be made to the graph of  to obtain the graph of: | **3** |
| (i) | Emma is standing looking up at the top of a building such that the angle of elevation is 26°. She then walks towards the building until the angle of elevation is 53°. She is now 15 m away from the base of the building.  15 m  Building (*h*)  *A*  *C*  *B*  Show that the height (*h*) of the building is 19·9 m.  Find the distance that Emma walked from the first point (*A*) to the second point (*B*). Give your answer to the nearest metre. | **2**  **3** |

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| (j) | A water tank is emptying according to the equation  where *A* is the amount of water in the tank, in litres, and *t* is the time, in minutes. | |  |
|  | (i) | How much water is initially in the tank? | **1** |
|  | (ii) | At what time is the tank half full? | **2** |
|  | (iii) | What does the gradient of this equation represent? | **1** |
| (k) | Solve the simultaneous equations for *x* and *y*. | | **3** |

**End of Examination**