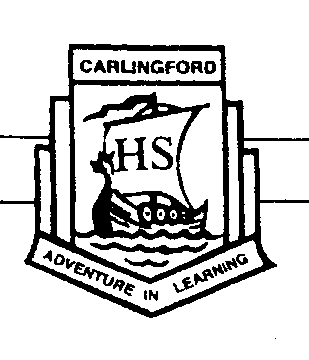
**Carlingford High School**



**Mathematics**

**Year 9 5.3 Term 3 Examination**

**2019**

**Time allowed: 50 minutes**

**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class: 9MAT3\_\_**

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| **Please circle your teacher:** | **Mrs Wilson/**  **Mrs Young** | **Mrs Lego** | **Mr Wilson** |

**Instructions:**

* Use blue or black pen
* Pencil may be used for graphs or diagrams only
* Board approved calculators may be used
* No lending or borrowing
* Show all necessary working out in the space provided
* Marks may be deducted for untidy setting out
* All questions are worth one mark unless otherwise shown

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| --- | --- | --- | --- | --- | --- | --- |
| **Topic** | **Factorising** | **Trigonometry** | **Surds** | **Problem Solving** | **Total** |  |
| **Mark** | **/20** | **/22** | **/20** | **/2** | **/64** | **%** |

**Factorising (20 marks)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  | | --- | --- | --- | --- | | 1. |  | Fully factorise the following. |  | |  | a) |  |  | |  |  |  |  | |  | b) |  | **2** | |  |  |  |  | |  | c) |  | **2** | |  |  |  |  | | 2. | Factorise each quadratic expression. | |  | |  | a) |  |  | |  |  |  |  | |  | b) |  |  | |  |  |  |  | |  | c) |  | **2** | |  |  |  |  | |  | d) |  | **2** | |  |  |  |  | | |  |  |  |  | | --- | --- | --- | --- | | 3. |  | Simplify each expression fully. |  | |  | a) |  | **2** | |  |  |  |  | |  | b) |  | **2** | |  |  |  |  | |  | c) |  | **2** | |  |  |  |  | |  | d) |  | **3** | |  |  |  |  | |

**Trigonometry (22 marks)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  | | --- | --- | --- | --- | | 1. |  | Complete the ratios for the triangle below, giving your answers as fractions. | **2** | |  |  |  |  | |  |  |  |  | |  |  |  |  | | 2. |  |  |  | |  | a) | In the triangle with hypotenuse of length 13, |  | |  | b) | Use your answer for a) and an expression for in the larger triangle to give the value of as a fraction. |  | |  |  |  |  | | 3. |  | Calculate, correct to one decimal place, the value of each pronumeral. |  | |  | a) |  | **2** | |  |  |  |  | | |  |  |  |  | | --- | --- | --- | --- | |  | b) |  | **2** | |  |  |  |  | | 4. |  | Find the value of , correct to the nearest minute. | **2** | |  |  |  |  | |  |  |  |  | | 5. |  | The base of an isosceles triangle is 12.6 cm long, and each of its base angles is . Find the perimeter of the triangle, correct to one decimal place. | **3** | |  |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  |  | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  | | --- | --- | --- | --- | | 6. |  | A plane is flying at a height of 750 m.  If the angle of elevation from an observer at the end of the runway to the plane is , what is the horizontal distance between the plane and the end of the runway, correct to the nearest metre? | **2** | |  |  |  |  | |  |  |  |  | | 7. |  | The beam of a see saw is 4.2 m long. If one end is 1.4 m above the ground at its highest point, find the angle of elevation of the beam, correct to the nearest degree. | **2** | |  |  |  |  | |  |  |  |  | | |  |  |  |  | | --- | --- | --- | --- | | 8. |  |  |  | |  | a) | What is the bearing of from |  | |  |  |  |  | |  | b) | What is the bearing of from ? |  | |  |  |  |  | |  |  |  |  | | 9. |  | Two fishing boats set out at the same time from port . The first boat sails on a bearing of while the second sails on a course of . The first boat sails 80 km to point where it is due north of the second boat at point . |  | |  | a) | Draw a diagram representing this information. |  | |  |  |  |  | |  | b) | Find the distance between the two boats, correct to one decimal place. | **2** | |  |  |  |  | |

**Surds (20 marks)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  | | --- | --- | --- | --- | | 1. |  | Circle all irrational numbers. |  | |  |  | , | **2** | |  |  |  |  | | 2. |  | Simplify the following. |  | |  | a) |  |  | |  |  |  |  | |  | b) |  |  | |  |  |  |  | | 3. |  | Simplify fully. |  | |  | a) |  |  | |  |  |  |  | |  | b) |  | **2** | |  |  |  |  | |  | c) |  |  | |  |  |  |  | |  | d) |  | **2** | |  |  |  |  | |  |  |  |  | | |  |  |  |  | | --- | --- | --- | --- | | 4. |  | Expand and simplify. |  | |  | a) |  |  | |  |  |  |  | |  | b) |  | **2** | |  |  |  |  | |  | c) |  | **2** | |  |  |  |  | | 5. |  | Simplify, giving your answer with a rational denominator. |  | |  | a) |  |  | |  |  |  |  | |  | b) |  | **2** | |  |  |  |  | |  |  |  |  | |  | c) |  | **2** | |

**Problem Solving (2 marks)**

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| |  |  |  |  | | --- | --- | --- | --- | | 1. | Find the smallest positive integer such that and are both integers. | |  | |  |  |  |  | |  |  |  |  | | |  |  |  |  | | --- | --- | --- | --- | | 2. | The diagram shows a square pyramid whose base edges are 4 cm and slant edges are 6 cm. Find the exact value of . | |  | |  |  |  | | |  | |  |  |  | | |  | |
| **End of Exam - Please check your work.** | |