**YEAR 11 TEST 5 NON-CALCULATOR ENHANCED**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Common Graphs | /20 | Inequalities | /15 | Algebraic fractions | /20 | Loci Vectors | /20 |

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|  | **Algebra: Graphs** |  |
| **1.**  **S** | Sketch the following graphs. Make sure you label any intercepts on the axes.  a) b) c) d) | **(6)** |
| **2.**  **F** | |  |  |  | | --- | --- | --- | | *A* | *B* | *C* |   Match the letter of the graph with the number of the possible equation:   |  |  |  |  | | --- | --- | --- | --- | | *1* | *2* | *3* | *4* | | *y = x2 + 6x + 5* | *y = -5 + 6x - x2* | *y = 5 + 4x –- x2* | *y = x2  + 4x – 5* | | **(3)** |
| **3.**  **F** | The graph of y = f(*x*) is shown.   1. Write down the co-ordinates of the turning point of the graph. 2. Write down estimates for the roots of f(x) = 0 3. Use the graph to find an estimate of f(2) | **(1)**  **(1)**  **(1)** |
| **4.**  **M** | The graph shows      *y* = sin *x*    for    0° ≤ *x*  ≤ 360°  a) sin *x* = sin 30°      and      90° < *x* < 360°  Work out the value of angle *x*.  b) sin *x* = −sin 30°     and     180° < *x* < 360°  Work out **two** of the values of angle *x*. | **(1)**  **(2)** |
| **5.**  **F** | Matt sketches the graph of for *x* ≥ 0.  Make one criticism of his sketch. | **(1)** |
| **6.**  **M** | Here is a sketch of the graph .  The curve intersects the *x* axis at (5, 0) and the point P.  The curve intersects the *y* axis at (0, -10)  Work out the *x* co-ordinate of the turning point of the graph. | **(4)** |
|  | **TOTAL** | **20** |
|  | **Algebra: Inequalities** |  |
| **1.**  **S** | |  |  |  |  | | --- | --- | --- | --- | | a) | Write the inequality shown below. | b) | Write down the integer values satisfied by this diagram. | |  |  |  |  | | **(2)**  **(2)** |
| **2.**  **F** | Work out **all** the integers that satisfy the inequality:  12 < 5*x* - 3 ≤ 32 | **(2)** |
| **3.**  **F** | Solve    9*x* + 4 > 2*x* – 1 | **(2)** |
| **4.**  **F** | Copy the grid shown.  Show the region satisfied by the three inequalities.     |  |  |  | | --- | --- | --- | | *y* | ≥ | 1 | | *y* | ≤ | *x* | | *x* + 2*y* | ≤ | 8 | |  |  |  |   Label the region clearly with the letter R | **(3)** |
| **5.**  **M** | Solve | **(4)** |
|  | **TOTAL** | **15** |
|  |  |  |
|  | **Algebra: Algebraic fractions** |  |
| **1.**  **S** | Simplify | **(3)** |
| **2.**  **F** | Write as a single fraction | **(3)** |
| **3.**  **F** | Simplify | **(3)** |
| **4.**  **F** | |  |  |  | | --- | --- | --- | | Express |  | as a single fraction in its simplest form. | | **(3)** |
| **5.**  **M** | Simplify | **(4)** |
| **6.**  **M** | The function f is defined by  Show that | **(4)** |
|  | TOTAL | **20** |
|  | **Geometry: Loci and Vectors** |  |
| **1.**  **F** | Use ruler and compasses to **construct** an angle of 30° | **(4)** |
| **2.**  **S** | and  Calculate the following:  a) b) c) | **(4)** |
| **3.**  **F** | *OAB* is a triangle.  **a**  **b**  a)  Write down the vector in terms of **a** and **b**.  *X* is the point on *AB* such that *AX* : *XB* = 1 : 4  b)  Express the vector in terms of **a** and **b**. | **(1)**  **(3)** |
| **4.**  **F** | *ABC* is a straight line.  *AB* : *BC* = 2 : 5    a) Express in terms of **a** and **b**.   Give your answer in its simplest form.  b) Express in terms of **a** and **b**.   Give your answer in its simplest form. | **(2)**  **(3)** |
| **5.**  **M** | Is BCD a straight line?  You must show working out to justify your answer. | **(3)** |
|  | **TOTAL** | **20** |