**Year 11 to Year 12 Transition Paper**

**Quadratics**

**Mark Scheme**

|  |  |  |
| --- | --- | --- |
| **Question** | **Scheme** | **Marks** |
| **1(i)** |  | M1 |
| with comment (see notes) | A1 |
| As   hence  for all *x* | A1 |
|  | **(3)** |
| **(ii)** | For an explanation that it may not always be true  Tests say   whereas | M1 |
| States sometimes true and gives reasons  Eg. when  *x* =5  whereas  True  When   whereas Not true | A1 |
|  | **(2)** |
| **(5 marks)** | | |

|  |  |  |
| --- | --- | --- |
| **Question** | **Scheme** | **Marks** |
| **2(a)** |  | M1 |
|  | A1 |
|  | **(2)** |
| **(b)** | or | M1 |
|  | A1 |
|  | **(2)** |
| **(5 marks)** | | |

|  |  |  |
| --- | --- | --- |
| **Question** | **Scheme** | **Marks** |
| **3** |  | B1 |
| Accept or or or even or equivalent quadratic (or initial cubic) into two brackets | M1 |
|  | A1 |
|  | **(3)** |
| **(3 marks)** | | |

|  |  |  |
| --- | --- | --- |
| **Question** | **Scheme** | **Marks** |
| **4** | Realises that *k* = 0 will give no real roots as equation becomes 3 = 0 (proof by contradiction) | B1 |
|  | M1 |
| with attempt at solution | M1 |
| So 0 < *k* < , which together with *k* = 0 gives 0 ≤ *k* <  (\*) | A1 |
|  | **4(3)** |
| **(4 marks)** | | |

|  |  |  |
| --- | --- | --- |
| **Question** | **Scheme** | **Marks** |
| **5(a)** | shape in 1st quadrant  Correct  Asymptote | M1 |
| A1 |
| B1 |
|  | **(3)** |
| **(b)** | Combines equations | M1 |
| \* | A1\* |
|  | **(2)** |
| **(c)** | Attempts to set | M1 |
|  | A1 |
|  | A1 |
|  | **(3)** |
| **(8 marks)** | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Question** | **Scheme** | | **Marks** |
| **6(i)** |  |  | M1 |
|  |  | M1 |
|  |  | A1 |
| Deduces that  is a solution | | B1 |
|  | | **(4)** |
| **(ii)** |  | | M1 |
|  | | A1 |
|  | | dM1 |
| ,  only | | A1 |
|  | | **(4)** |
| **(8 marks)** | | | |

|  |  |  |
| --- | --- | --- |
| **Question** | **Scheme** | **Marks** |
| **7(a)** | 117 tonnes | B1 |
|  | **(1)** |
| **(b)** | 1200 tonnes | B1 |
|  | **(1)** |
| **(c)** | Attempts | M1 |
| 93 tonnes | A1 |
|  | **(2)** |
| **(d)** | States the model is only valid for values of *n* such that | B1 |
| States that the total amount mined cannot decrease | B1 |
|  | **(2)** |
| **(6 marks)** | | |

|  |  |  |
| --- | --- | --- |
| **Question** | **Scheme** | **Marks** |
| **8(a)** | Attempts | M1 |
| not sensible as the company would make a loss | A1 |
|  | **(2)** |
| **(b)** | Uses  or | M1 |
|  | dM1 |
| Minimum Price = £7.22 | A1 |
|  | **(3)** |
| **(c)** | States (i) maximum profit =£ 100 000  and (ii) selling price £9 | B1  B1 |
|  | **(2)** |
| **(7 marks)** | | |