**Year 11 to Year 12 Transition Paper**

**Quadratics**

**Mark Scheme**

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| **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 trueTests say   whereas  | M1  |
|  States sometimes true and gives reasonsEg. when  *x* =5  whereas  True When   whereas Not true | A1 |
|  | **(2)** |
| **(5 marks)** |

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

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

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| **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)** |

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

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

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| **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)** |

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| **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)** |