**Year 11 to Year 12 Transition Paper**

**Algebraic Expressions**

**Mark Scheme**

|  |  |  |
| --- | --- | --- |
| **Question** | **Scheme** | **Marks** |
| **1** | for expanding bracket to obtain 4 terms with all 4 correct without considering signs or for 3 terms out of 4 correct with correct signs | M1 |
|  | A1 |
| **(2 marks)** | | |

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| **Question** | **Scheme** | **Marks** |
| **2(a)** | For expanding bracket to obtain 4 terms with all 4 correct without considering signs or for 3 terms out of 4 correct with correct signs | M1 |
|  | A1 |
|  | **(2)** |
| **(b)** | for expanding bracket to obtain 4 terms with all 4 correct without considering signs or for 3 terms out of 4 correct with correct signs | M1 |
|  | A1 |
|  | **(2)** |
| **(4 marks)** | | |

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| **Question** | **Scheme** | **Marks** |
| **3(a)** | for expanding bracket to obtain 4 terms with all 4 correct without considering signs or for 3 terms out of 4 correct with correct signs | M1 |
|  | A1 |
|  | **(2)** |
| **(b)** | for correct factorisation  (B1 for a partial correct factorisation which shows a product of 3 or 4 factors)  6ut²(2u + 3t) | B2 |
|  | **(2)** |
| **(4 marks)** | | |

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| **Question** | **Scheme** | **Marks** |
| **4(a)** | = | M1 |
|  | A1 |
|  | **(2)** |
| **(b)** | **=** | M1 |
|  | dM1 |
| or *b* = 3, *c* = 6 | A1 |
|  | **(3)** |
| **(5 marks)** | | |

| **Question** | **Scheme** | **Marks** |
| --- | --- | --- |
| **5** |  | M1 |
|  | A1 cso |
|  | M1 |
|  | A1 cso |
| **(4 marks)** | | |

| **Question** | **Scheme** | **Marks** |
| --- | --- | --- |
| **6(a)** | 20 | B1 |
|  | **(1)** |
| **(b)** |  | M1 |
|  | A1 |
| Numerator = | M1 |
|  | A1 |
|  | **(4)** |
| **(5 marks)** | | |

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| **Question** | **Scheme** | **Marks** |
| **7(a)** | (B1 for a partial correct factorisation which shows a product of at least 3 factors, eg , ) | B2cao |
|  | **(2)** |
| **(b)** | for or | M1 |
|  | A1oe |
|  | **(2)** |
| **(c)** | for oe, eg (2*x* | B1 |
|  | **(1)** |
| **(5 marks)** | | |

| **Question** | **Scheme** | | **Marks** |
| --- | --- | --- | --- |
| **8(a)** | = | Cao | B1 |
|  | | **(1)** |
| **(b)** |  | For rationalising the denominator by a correct method (i.e. multiply numerator and denominator by ).  This statement is sufficient. | M1 |
| **or** | For 15 – 6√6 (or )in the numerator **or** 75 – 72 (or 3 from correct work) in the denominator seen at some point i.e. apply isw | A1 |
| **and** | For 15 – 6√6 (or )in the numerator **and** 75 – 72 (or 3 from correct work) in the denominator seen at some point i.e. apply isw | A1 |
|  | Fully correct expression.  Allow *a* = 5 *b* = 2, *c* = 6but apply isw e.g.  5 – 2√6 followed by *a* = 5 *b* = 2, *c* = 6 | A1 |
|  | | **(4)** |
| **(5 marks)** | | | |

| **Question** | | **Scheme** | **Marks** |
| --- | --- | --- | --- |
| **9(a)** |  | | M1 |
|  |  | | A1 cao |
|  |  | | **(2)** |
| **(b)** |  | | M1 |
|  | or | | dM1A1 |
|  |  | | **(3)** |
| **(5 marks)** | | | |

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| **Question** | **Scheme** | **Marks** |
| **10(a)** | 3*x*2 | B1cao |
|  | **(1)** |
| **(b)** | *a*10 | B1cao |
|  | **(1)** |
| **(c)** | *x*6 | B1cao |
|  | **(1)** |
| **(d)** | a correct first step eg 4*q*2 or – 2 | M1oe |
| for *d* = 4 | A1 |
| for *f* = oe | A1oe |
|  | **(3)** |
| **(6 marks)** | | |

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| **Question** | **Scheme** | **Marks** |
| **11(a)** | B2 cao  (B1 for a partial correct factorisation which shows a product of at least 3 factors)  9*xd*(7*x* + *d*) | B2 |
|  | **(2)** |
| **(b)** | for start to method of factorisation  e.g. and | M1 |
| for factorisation as product of 1 factor in terms of *a* and 1 factor in terms of *b*  e.g. | M1 |
| 2 | A1 |
|  | **(3)** |
| **(c)** | (*x* – 3*t*)(*x* + 3*t*) | B1 |
|  | **(1)** |
| **(6 marks)** | | |

| **Question** | **Scheme** | **Marks** |
| --- | --- | --- |
| **12(a)** | or | B1 |
|  | B1 |
|  | **(2)** |
| **(b)** | or  seen | M1 |
| (or better) | M1 |
| = | A1, A1 |
|  | **(4)** |
| **(6 marks)** | | |

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| **Question** | **Scheme** | **Marks** |
| **13(a)** |  | B1cao |
|  | **(1)** |
| **(b)** | 64  (B1 for 64, *n* ≠ 3 or *c*, *c* ≠ 64) | B2cao |
|  | **(2)** |
| **(3 marks)** | | |

| **Question** | **Scheme** | **Marks** |
| --- | --- | --- |
| **14(a)** |  | B1 |
|  | **(1)** |
| **(b)** | For  or  or or 0.25 as coefficient of , for any value of *k* including *k* = 0 | M1 |
| Correct index for *x* so *A*or o.e. for any value of *A* | B1 |
| =  or 0.25 | A1 cao |
|  | **(3)** |
| **(4 marks)** | | |

| **Question** | **Scheme** | | | **Marks** |
| --- | --- | --- | --- | --- |
| **15(i)** |  |  | |  |
|  |  | | M1 |
|  | seen or implied at any point. | | B1 |
|  | or | | A1 |
|  | | | **(3)** |
| **(ii)** | Method 1 | Method 2 | Method 3 |  |
| **Either** | Or |  | M1 |
|  |  | . | B1 |
|  |  |  |  |
|  | | | A1 |
|  | | | **(3)** |
| **(6 marks)** | | | | |

| **Question** | **Scheme** | **Marks** |
| --- | --- | --- |
| **16(a)** |  | M1 |
|  | A1 |
|  | **(2)** |
| **(b)** |  | M1 |
|  | A1 |
|  | **(2)** |
| **(4 mark** | | |

| **Question** | **Scheme** | | **Marks** |
| --- | --- | --- | --- |
| **17** |  | Writing this is sufficient for M1. | M1 |
|  | For .  This mark can be implied. | A1 |
|  |  | B1 B1 |
|  |  | A1 cso |
| **(5 marks)** | | | |

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| **Question** | **Scheme** | **Marks** |
| **18** | 64  for 64  (B1 for 64 or ) | B2 |
| **(2 marks)** | | |

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| **Question** | **Scheme** | **Marks** |
| **19(a)** | *x*2 | B1cao |
|  | **(1)** |
| **(b)** | for 43(=64) or *y* 3 × (= *y* 2) | M1 |
| 64*y*2 | A1cao |
|  | **(2)** |
| **(c)** | *a* = 3, *b* = −2, *n* = 4  for all 3 correct values  (B1 for 2 correct values) | B2 |
|  | **(2)** |
| **(d)** | for one correct expansion or use of difference of 2 squares | M1 |
| 24*y* | A1cao |
|  | **(2)** |
| **(7 marks)** | | |

| **Question** | **Scheme** | | **Marks** |
| --- | --- | --- | --- |
| **20(i)**  **Way 1** |  | Writes one of the terms of the given expression correctly in terms of | M1 |
|  | A correct answer of  A correct answer with **no** working implies both marks. | A1 |
|  | | **(2)** |
| **(i)**  **Way 2** |  | Writes one of the terms of the given expression correctly in terms of | M1 |
|  | A correct answer of  A correct answer with **no** working implies both marks. | A1 |
|  | | **(2)** |
| **(i)**  **Way 3** | or | Writescorrectly as  or | M1 |
|  | A correct answer of  A correct answer with **no** working implies both marks. | A1 |
|  | | **(2)** |
| **(i)**  **Way 4** | or | Writescorrectly as  or | M1 |
|  | A correct answer of  A correct answer with **no** working implies both marks. | A1 |
|  |  | **(2)** |

|  |  |  |  |
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| **Question** | **Scheme** | | **Marks** |
| **(ii)**  **Way 1** | or | For or  This may be implied by subsequent work. | B1 |
| or | Solves an equation of the form  6*x* – 3 = *k* where *k* is their power of 3. | M1 |
|  | with a dot over the 6 | A1 |
|  | | **(3)** |
| **Way 2** |  | For  This may be implied by subsequent work. | B1 |
|  | Solves an equation of the form  *k*(6*x* – 3) = 1 where *k* is their power of 81. | M1 |
|  | with a dot over the 6 | A1 |
|  | | **(3)** |
| **Way 3** |  | For  **and**  This may be implied by subsequent work. | B1 |
|  | Solves an equation of the form  *p*(6*x* – 3) = *q* where *p* is their power of 9 for the 3 and *q* is their power of 9 for the 81. | M1 |
|  | with a dot over the 6 | A1 |
|  | | **(3)** |
| **Way 4** |  | For writing 36*x* – 3 correctly in terms of 36*x* | B1 |
|  | Solves an equation of the form  6*x* = *k* where *k* is their  written as a power of 3. | M1 |
|  | with a dot over the 6 | A1 |
|  | | **(3)** |
| **Way 5** |  | Takes logs of both sides | B1 |
|  |  | Solves an equation of the form  6*x* – 3 = *k* where *k* is their | M1 |
|  |  | with a dot over the 6 | A1 |
|  |  | | **(3)** |
| **(5 marks)** | | | |