**Year 11 to Year 12 Transition Paper**

**Algebraic Expressions**

**Mark Scheme**

|  |  |  |
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| **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 |
| $$12x2 – 5x – 3$$ | 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 |
| $$2x²-7x-4$$ | 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 |
| $$9x²-30xy+25y²$$ | 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 |
| $$x²+xy-2y²$$ | 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)** | $$8wy²(3wy-1)$$(B1 for a partial correct factorisation which shows a product of at least 3 factors, eg $8wy(3wy²-y)$, $4y(6w²y²-2wy)$) | B2cao |
|  | **(2)** |
| **(b)** | for $3e\left(f-1\right)and 2\left(f-1\right)$ or $$f\left(3e+2\right)and-1(3e+2)$$ | M1 |
| $$\left(3e+2\right)(f-1)$$ | A1oe |
|  | **(2)** |
| **(c)** | $$\left(5-2x\right)(5+2x)$$for $\left(5-2x\right)\left(5+2x\right)$ oe, eg $-$(2*x* $- 5)(2x+5)$ | 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 $\frac{7}{2}$ – 2 | M1oe |
| for *d* = 4 | A1 |
| for *f* = $\frac{3}{2}$ 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 factorisatione.g. $4b\left(a – 2\right)$ and $2(a – 2)$  | M1 |
| for factorisation as product of 1 factor in terms of *a* and 1 factor in terms of *b*e.g. $\left(4b + 2\right)\left(a – 2\right)$ | M1 |
| 2$\left(a – 2\right)\left(2b + 1\right)$ | 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)** | $$p^{8}$$ | B1cao |
|  | **(1)** |
| **(b)** | 64$t^{3}$(B1 for 64$t^{n}$, *n* ≠ 3 or *c*$t^{3}$, *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$x²$for 64$x²$(B1 for 64 or $x²$) | B2 |
| **(2 marks)** |

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| **Question** | **Scheme** | **Marks** |
| **19(a)** | *x*2 | B1cao |
|  | **(1)** |
| **(b)** | for 43(=64) or *y* 3 × $\frac{2}{3}$ (= *y* 2) | M1 |
| 64*y*2  | A1cao |
|  | **(2)** |
| **(c)** | *a* = 3, *b* = −2, *n* = 4for 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)** |