**Year 11 to Year 12 Transition Paper**

**Algebraic Methods**

**Mark Scheme**

| **Question** | **Working** | **Answer** | **Mark** | **Notes** |
| --- | --- | --- | --- | --- |
| **1** |  | $$\frac{x-1}{x+8}$$ | 2 | M1 for (*x*− 1)(*x*+ 8)A1cao |
| **2** | $$\frac{2x(x-3)+7(x+3)}{(x+3)(x-3)}$$ | $$\frac{2x²+x+21}{\left(x+3\right)(x-3)}$$ | 3 | M1 for using a correct common denominator,eg $\left(x+3\right)(x-3)$M1 for $\frac{2x(x-3)+7(x+3)}{(x+3)(x-3)}$ oeA1 for $\frac{2x²+x+21}{\left(x+3\right)(x-3)}$ or $\frac{2x²+x+21}{x²-9}$ |
| **3** |  | $$\frac{5x²-6x-12}{\left(3x+4\right)(2x-1)}$$ | 3 | M1 for using a correct common denominatorA1 for $\frac{x\left(2x-1\right)+\left(x-3\right)(3x+4)}{(3x+4)(2x-1)}$A1 for $\frac{5x²-6x-12}{\left(3x+4\right)(2x-1)}$ or $\frac{5x²-6x-12}{6x²+5x-4}$ |
| **4** |  | $$\frac{1}{x^{2}- 9 }$$ | 2 | M1 for $x^{2}- 9$ $= \left(x+3\right)(x-3)$ or for $(x-3)²(x+3)²$ = ($x^{2}- 9)²$A1 for $\frac{1}{x^{2}- 9 }$ or $\frac{1}{(x+3)(x-3)}$ |
| **5** | $$\frac{\left(x-3\right)(x+3)}{\left(x-3\right)(x-1)}$$ | $$\frac{x+3}{x-1}$$ | 3 | B1 for $\left(x-3\right)(x+3)$ B1for $\left(x-3\right)\left(x-1\right)$B1 cao |
| **6** |  | $$\frac{1}{u-2}$$ | 2 | M1 for factorisation of  A1 |
| **7** | $$\frac{\begin{array}{c}\\\left(x\right)\left(x+3\right)+\left(x-2\right)(x-3)\end{array}}{\left(x-3\right)(x+3)}$$ | $$\frac{2x^{2}-2x+6}{\left(x-3\right)(x+3)}$$ | 3 | M1 for using a correct common denominatorA1 $\frac{\left(x\right)\left(x+3\right)+\left(x-2\right)(x-3)}{\left(x-3\right)(x+3)}$ oeA1 $\frac{2x^{2}-2x+6}{\left(x-3\right)(x+3)}$ or $\frac{2(x^{2}-x+3)}{\left(x-3\right)(x+3)}$ or $\frac{2x^{2}-2x+6}{\left(x²-9\right)}$ or $\frac{2(x^{2}-x+3)}{\left(x²-9\right)}$ |
| **8** |  |  | 3 | M1 for complete factorisation or multiplying and inverting second fractionM1 for complete factorisation **AND** multiplying and inverting second fractionA1 for or 1 −  |
| **9** |  | $$\frac{20x-3}{4x²-9}$$ | 3 | M1 for using $\left(2x-3\right)\left(2x+3\right) $as the common denominator M1 (dep M1) for a complete method to simplify to a single fraction A1 $\frac{20x-3}{4x²-9}$ or $\frac{20x-3}{\left(2x-3\right)(2x+3)}$ |
| **10** |  |  | 2 | M1 for a correct factorisation of denominator into linear factors,  or 2 or A1 for  |
| **11** |  | $\frac{3x - 8y}{5\left(x - y\right)(x + y)}$  | 4 | M1 for correct factorisation of *x*2 – *y*2, e.g. (*x* – *y*)(*x* + *y*) M1 for finding a common denominator, e.g. 5(*x* – *y*)(*x* + *y*) or (5*x* + 5*y*)(*x*2 – *y*2)M1 (dep M1) for correct method to combine fractionsA1 for $\frac{3x - 8y}{5\left(x - y\right)(x + y)}$ or $\frac{3x - 8y}{\left(5x - 5y\right)(x + y)}$ or $\frac{3x - 8y}{\left(x - y\right)(5x + 5y)}$ or $\frac{3x - 8y}{5(x² - y²)}$ or $\frac{3x - 8y}{5x² - 5y²}$  |
| **12** |  |  | 3 | M1 for correct method to combine the fractionsM1(dep) for full simplification of the numeratorA1 for  or  or  or   |
| **13** |  |  | 2 | M1 for factorisation of numerator or denominatorA1 for  |
| **14** |  ÷  ×  | − | 4 | M1 for factorisation of one termM1 for factorisation of both numerators and both denominatorsM1 for multiplying by the reciprocal of the second fractionA1 cao |
| **15** |    |  | 3 | M1 Takes a common factor of *x* out of the denominator and writes the numerator in factors.dM1 Further factorises the denominator and cancelsA1 Shows that with no errors or omissions |