| **Question** | **Scheme** | **Marks** |
| --- | --- | --- |
| **1(a)** |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *x* | 1 | 1.5 | 2 | 2.5 | 3 | 3.5 | 4 |
| *y* | 16.5 | 7.361 | **4** | **2.31** | 1.278 | 0.556 | 0 |

 | B1 B1 |
|  |  | **(2)** |
| **1(b)** |   | B1 M1 A1ft |
| = 11.88 (or answers listed below in note) | A1 |
|  |  | **(4)**  |
| **1(c)** |  =   | M1 A1 A1 |
|  = | M1 |
|  = or equivalent | A1 |
|  |  | **(5)** |
|  |  | **(6 marks)** |
| **2(a)** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | *x* | 2 | 2.25 | 2.5 | 2.75 | 3 |
|  | *y* | 0.5 | 0.38 | 0.298507… | 0.241691… | 0.2 |

 |  |
| At At  | At least one *y*-ordinate correct. | B1 |
|  | Both *y*-ordinates correct. | B1 |
|  |  | **(2)** |
| **2(b)** |  | Outside brackets  or   | B1 aef |
| For structure of ; | M1 |
| Correct expression inside brackets which all must be multiplied by their “outside constant”. | A1 |
|  |  | A1 |
|  |  | **(4)** |
| **2(c)** | Area of triangle  | B1 |
|  | M1 |
|  | A1 ft |
|  |  | **(3)** |
|  |  | **(9 marks)** |
| **3(a)** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *x* | 0 | 0.25 | 0.5 | 0.75 | 1 |
| *y* | 1 | 1.251 | **1.494** | **1.741** | 2 |

 | B1 B1 |
|  |  | **(2)** |
| **3(b)** | o.e.  | B1 M1 A1 ft |
| = 1.4965  | A1 |
|  |  | **(4)** |
|  |  | **(6 marks)** |
| **4(a)** |  |  |
| 6.272 , 3.634 | B1 B1 |
|  |  | **(2)** |
| **4(b)** |  | B1 |
|  | Need {} or implied later for A1ft | M1A1ft |
| = |  |
| = 11.42 | A1 cao |
|  |  | **(4)** |
| **4(c)** | =  | M1: on any term | M1A1A1A1 |
| A1:  |
| A1:  |
| A1: + |
|  | Attempt to subtract either way round using the limits 4 and 1. Dependent on the previous M1 | dM1 |
| = (48 – 36) |  |
| 12 | A1 cao |
|  |  | **(6)** |
|  |  | **(12 marks)** |
| **5(a)** | (a) ,  awrt ,   | B1 B1 |
|  |  | **(2)** |
| **5(b)** | (b)  | B1 |
|   | M1 |
|   Accept 1.3 | A1 |
|  |  | **(3)** |
| **5(c)** | (c)  | B1 |
|   | B1 |
|   | M1 |
| Hence  🞹 cso | A1 |
|  |  | **(4)** |
| **5(d)** |  (d)  | M1 A1 |
|   |  |
|   | M1 A1 |
|  |  |
|   |  |
|  = | M1 |
|    | A1 |
|  |  |  **(6)**  |
|  |  | **(15 marks)** |
| **6(a)** | 0.73508 | B1 **cao** |
|  |  | **(1)** |
| **6(b)** |  | B1 M1 |
|  (4 dp) | awrt 1.1504  | A1 |
|  |  | **(3)**  |
| **6(c)** |  |  | B1 |
|  |  | B1 |
|   |  | M1 |
|  |  | dM1 |
|   **AG** |  | A1 cso |
|  |  |  | **(5)**  |
| **6(d)** |  | Applying limits  and either way round. | M1 |
|  |  |
|  | or  or awrt 1.2 | A1 |
|  | awrt 0.077 or awrt 6.3(%) | A1 cso  |
|  |  | **(3)** |
|  |  | **(12 marks)** |
| **7(a)** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *x* | 1 | 2 | 3 | 4 |
| *y* | ln2 |  |  | 2ln8 |
|  | 0.6931 | 1.9605 | 3.1034 | 4.1589 |

 | M1 |
|   | B1 |
|   | M1 |
|   7.49 cao | A1 |
|  |  | **(4)** |
| **7(b)** |   | M1 A1 |
|   |  |
|   | M1 A1 |
|  |  | **(4)** |
| **7(c)** |   | M1 |
|   Using or implying  | M1 |
|   | A1 |
|  |  |  **(3)** |
|  |  | **(11 marks)** |
| **8(a)** |  awrt | B1 |
|   awrt or  | B1 |
|  |  | **(2)** |
| **8(b)** |  | B1 M1 A1ft |
|  |   0.542 or 0.543  | A1 |
|  |  | **(4)** |
| **8(c)** |  | B1 |
|   | M1 |
|   | A1 |
|    | M1 A1 |
|  ,  | B1 |
|   | M1 |
|    | A1 |
|  |  |  **(8)**  |
|  |  | **(14 marks)** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Source paper** | **Question number** | **New spec references** | **Question description** | **New AOs** |
| 1 | C2 Jan 2012 | 6 | 8.2, 8.3 and 9.3 | Integration, numerical integration | 1.1b |
| 2 | C2 Jan 2011 | 6 | 9.3, 8.3 | Integration, numerical integration | 1.1b, 3.1a |
| 3 | C2 2012 | 7 | 9.3 | Numerical integration | 1.1b |
| 4 | C2 Jan 2013 | 9 | 8.3, 9.3 | Integration, numerical integration | 1.1b |
| 5 | C4 2011 | 4 | 8.3, 8.4, 9.4 | Integration, Numerical integration | 1.1b |
| 6 | C4 Jan 2012 | 6 | 8.2, 8.3, 8.5, 9.4 | Integration | 1.1b, 2.1,  |
| 7 | C4 2012 | 7 | 8.5, 9.4 | Integration, Numerical integration | 1.1b, 2.1 |
| 8 | C4 Jan 2011 | 7 | 8.3,8.5, 9.4 | Integration, Numerical integration | 1.1b, 3.1a |