| **Question** | **Scheme** | | **Marks** |
| --- | --- | --- | --- |
| **1** |  | | M1 A1 |
|  | | A1; A1 |
|  |  | | **(4 marks)** |
| **2** |  | | M1 A1 A1 |
|  | | A1 |
|  |  | | **(4 marks)** |
| **3** |  | |  |
|  | | M1 |
|  | | A1 |
| Two of: | | A1 |
|  | | A1 |
|  |  | | **(4 marks)** |
| **4** |  | | M1A1A1 |
|  | | **d**M1 |
|  | | A1**cso** |
|  |  | | **(5 marks)** |
| **5** |  | | M1A1 |
| or  added to | | dM1 |
|  | or | A1 |
|  | |  |
| Area of Rectangle  or  Area of Rectangle**s**  and | | M1 |
| Evidence of  **or**  or  Evidence of  **and** | |  |
| So, | | dddM1A1 |
|  |  | | **(7 marks)** |
| **6** |  | |  |
|  | | B1 |
|  | | M1 |
|  | | A1 A1 |
| Use  *x* =4, *y* =37 to give equation in *c* , | | M1 |
|  | | A1 |
|  | | A1 |
|  |  | | **(7 marks)** |
| **7** | or | | M1A1 |
| 10 = 8 – 6 + 10 + *c* | | M1 |
| *c* = | | A1 |
| f(1) =  =  (o.e.) | | A1ft |
|  |  | | **(5 marks)** |
| **8(a)** |  | |  |
|  | | M1, A1, A1 |
| Substitute *x* = 4, *y* = 25 ⇒ 25 = 8 – 40 + 4 + *c* ⇒ *c* = | | M1 |
|  | |  |
|  | | A1 |
|  |  | | **(5)** |
| **8(b)** | Sub *x* = 4 into | | M1 |
|  | |  |
|  | | A1 |
| Gradient of tangent = 2 ⇒ Gradient of normal is –1/2 | | dM1 |
|  | |  |
| Substitute *x* = 4, *y* = 25 into line equation with their changed gradient  e.g. | | dM1 |
| o.e. (but must have integer coefficients) | | A1cso |
|  |  | | **(5)** |
|  |  | | **(10 marks)** |
| **9(a)** |  | | M1 |
|  | | A1 |
| or | | M1 |
|  | | A1 |
|  |  | | **(4)** |
| **9(b)** | **Allow the marks in (b) to score in (a) i.e. mark (a) and (b) together** | |  |
|  | | M1A1A1 |
|  | | M1 |
|  | | A1 |
|  |  | | **(5)** |
|  |  | | **(9 marks)** |
| **10(a)** |  | | M1 A1 A1 |
| Sub into | | M1 |
|  | | A1 |
|  |  | | **(5)** |
| **10(b)** | Gradient of normal is  Gradient of tangent = +2 | | M1  A1 |
|  | | M1 |
|  | | M1 |
|  | | A1 |
|  |  | | **(5)** |
|  |  | | **(10 marks)** |
| **11(a)** | Puts  and rearranges to give three term quadratic | Or puts  and rearranges to give three term quadratic | M1 |
| Solves their  using acceptable method as in general principles to give *x* = | Solves their  using acceptable method as in general principles to give *y* = | M1 |
| Obtains *x* = 2 , *x* = 9 (may be on diagram or in part (b) in limits) | Obtains *y* = 8, *y* = 1 (may be on diagram) | A1 |
| Substitutes their *x* into a given equation to give *y* = (may be on diagram) | Substitutes their *y* into a given equation to give *x=* (may be on diagram or in part (b)) | M1 |
| *y* = 8, *y* = 1 | *x* = 2, *x* = 9 | A1 |
|  |  | | **(5)** |
| **11(b)** |  | | M1 A1 A1 |
|  | | dM1 |
| or | |  |
|  | | B1 |
| So area of *R* is  or | | M1A1  cao |
|  |  | | **(7)** |
|  |  | | **(12 marks)** |
| **12(a)** | May mark (a) and (b) together | |  |
| Expands to give | | B1 |
| Integrates to give  (+ *c* ) | | M1A1ft |
| Simplifies to (+ *c* ) | | A1cao |
|  |  | | **(4)** |
| **12(b)** | Use limits 0 and 4 either way round on their integrated function (may only see 4 substituted) | | M1 |
| Use limits 4 and 9 either way round on their integrated function | | dM1 |
| Obtains either –32 or  194 needs at least one of the previous M marks for this to be awarded | | A1 |
| (So area =  ) i.e. 32 + 194, = 226 | | ddM1 A1 |
|  |  | | **(5)** |
|  |  | | **(9 marks)** |
| **13(a)** | Seeing | | B1 |
|  |  | | **(1)** |
| **13(b)** | ( without simplifying) | | B1 |
| or | | M1A1ft |
| **or**  One integral  (42.6 or awrt 42.7 ) **or**  other integral = (6.6 or awrt 6.7) | | dM1 |
|  | | A1 |
| Hence  or | | dM1 |
| or 49.3 or  (NOT ) | | A1 |
|  | (An answer of  may not get the final two marks – check solution carefully) | | **(7)** |
|  |  | | **(8 marks)** |
| **14(a)** |  | | M1  A1  A1 |
|  |  | | **(3)** |
| **14(b)** |  | | M1 |
|  | |  |
|  | | ddM1 |
|  | | A1 oe |
|  |  | | **(3)** |
|  |  | | **(6 marks)** |

|  |  |  |  |  |  |
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|  | **Source paper** | **Question number** | **New spec references** | **Question description** | **New AOs** |
| 1 | C1 2012 | 1 | 8.1 and 8.2 | Integration | 1.1b |
| 2 | C1 2016 | 1 | 8.2 and note to 8.1 | Integration | 1.1b |
| 3 | C1 2017 | 1 | 8.2 | Integration | 1.1b |
| 4 | C2 2014 | 4 | 8.2 and 8.3 | Integration | 1.1b |
| 5 | C2 June 2014R | 6 | 8.3 | Integration | 1.1b |
| 6 | C1 June 2014R | 8 | 8.1, 8.2 and 8.3 | Integration | 1.1b |
| 7 | C1 Jan 2012 | 7 | 8.1 and 8.2 | Integration | 1.1b, 3.1a |
| 8 | C1 2014 | 10 | 7.3, 8.1 and 8.2 | Integration, application of differentiation | 1.1b |
| 9 | C1 2017 | 7 | 2.1, 3.1, 7.1, 7.3, 8.1, 8.2 | Integration, tangent | 1.1b , 2.5 and 3.1a |
| 10 | C1 2015 | 10 | 7.3, 8.1, 8.2 | Integration, tangent/normal problem | 1.1b, 3.1a |
| 11 | C2 2012 | 5 | 2.4, 8.2 and 8.3 | Integration | 1.1b, 3.1a |
| 12 | C2 2015 | 6 | 8.2 and 8.3 | Integration | 1.1b, 2.4, 3.1a |
| 13 | C2 2013 | 6 | 8.2 and 8.3 | Integration | 1.1b, 2.1, 2.4, 3.1a |
| 14 | C2 2016 | 7 | 8.2 and 8.3 | Integration, areas | 1.1b, 3.1a |