| **Question** | **Scheme** | **Marks** |
| --- | --- | --- |
| **1(a)** |   | B1 |
|   | M1 A1 |
|  |  | **(3)** |
| **1(b)** |  |  |
|   | M1 A1 |
|   |  |
|  or  | A1 |
|   | dM1 |
|  and  | A1 |
|  |  | **(5)** |
| **1(c)** |  | M1 |
|    | A1 |
|  |  | **(2)** |
|  |  | **(10 marks)** |
| **2(a)** |    |  |
|    | B1 |
|   | M1A1 |
|  |  | **(3**) |
| **2(b)** |    | M1 |
|   | dM1 |
|   | A1 |
|   | ddM1A1 |
|  |  | **(5)** |
| **2(c)** |  | B1ft either B1ft both |
|  |  | **(2)** |
|  |   | **(10 marks)** |
| **3(a)** |   | M1 |
|    |  |
|   | M1 |
|   (or numerical answer awrt 0.28)  | A1 |
| States or uses cos50 = sin40 and cos40 =sin50 and so \* cao | A1 \* |
|  |  | **(4)** |
| **3(b)** |  Deduces   | M1 |
|  15.6 so  awrt 7.8(1) One answer  | A1 |
| Also  195.6, 375.6 , 555.6  awrt 7.8 , 97.8, 187.8, 277.8 All 4 answers | M1A1 |
|  |  |  **(4)** |
|  |   | **(8 marks)** |
| **4** |  |  |  |
|  | Substitutes either  or  or  for  | M1 |
|  |  |  |
|  | Forms a “quadratic in sine” = 0 | M1(\*) |
|  | Applies the quadratic formulaSee notes for alternative methods. | M1 |
|  |  |  |
|  | Any one correct answer | A1 |
|  | 180-their pv | dM1(\*) |
|  | All four solutions correct. | A1 |
|  |  | **(6 marks)** |
| **5(a)** |   | B1 |
|   | M1A1 |
|  |  | **(3)** |
| **5(b)** |  | M1 |
|    | A1 |
|  |  | **(2)** |
| **5(c)** |    | M1 |
|    | dM1 |
|    | A1A1 |
|  |  | **(4)** |
|  |  | **(9 marks)** |
| **6(a)** |  | M1A1 |
|  | M1A1 |
|  |  | **(4)** |
| **6(b)(i)** |  |  |
|  | M1 |
|  Maximum = 2 | A1 |
|  |  | **(2)** |
| **6(b)(ii)** |  | M1 |
|   | A1 |
|  |   | **(2)** |
|  |  | **(8 marks)** |
| **7(i)** |  | M1 |
|   |  |
|  States or uses  | B1 |
| **Uses**   | M1 |
|  | A1 |
|   cso | A1 |
|  |  | **(5)** |
| **7(ii)(a)** |  | M1 |
|   |  |
|  or  | A1\* |
|  |  | **(2)** |
| **7(ii)(b)** |   | M1 |
|   | A1 |
|  Any two of 0,30,150,180 | B1 |
|  All four answers 0,30,150,180  | A1 |
|  |  | **(4)** |
|  |  | **(11 marks)** |
| **8(a)** |  | B1 |
|  | M1A1 |
|  |  | **(3)** |
| **8(b)** |  | B1 |
|  | M1A1 |
|  |  | **(3)** |
| **8(c)** |  | M1A1A1 |
|  |  | **(3)** |
| **8(d)** | Sub and proceed to  | M1 |
|   | A1 |
|  =11 (10.78) | dM1A1 |
|   | ddM1A1 |
|  |  | **(6)** |
|  |  | **(15 marks)** |
| **9(a)** |   | B1 |
|   | M1A1 |
|  |  | **(3)** |
| **9(b)** |  maximum value of 24sin*x* + 7cos*x* = 25 so  | M1A1 |
|  |  | **(2)** |
| **9(c)** |  Distance *AB =*  , with   | M1 B1 |
|  So distance = 7.29m m | A1 |
|  |  | **(3)** |
| **9(d)** |   | M1 A1 |
|   | dM1 dM1 |
|   | A1 A1 |
|  |   | **(6)** |
|  |  | **(14 marks)** |
| **10(a)** |   | B1 |
|   | M1A1 |
|  |  | **(3)** |
| **10(b)** |   | B1ft |
|   | M1A1 |
|  |   | **(3)** |
| **10(c)** |  4 | B1 |
|   | M1A1 |
|  |  | **(3)** |
|  |  | **(9 marks)** |

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|  | **Source paper** | **Question number** | **New spec references** | **Question description** | **New AOs** |
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