| **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 | | M1  A1 |
|  |  | | **(4)** |
|  |  | | **(8 marks)** |
| **4** |  |  |  |
|  | Substitutes either  or  or  for | M1 |
|  |  |  |
|  | Forms a “quadratic in sine” = 0 | M1(\*) |
|  | Applies the quadratic formula  See 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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