| **Question** | **Scheme** | **Marks** |
| --- | --- | --- |
| **1(a)** |   | M1 |
|  (or equivalent) | A1 |
|   | A1 **cso** |
|  |  | (3) |
| **1(b)** | Use of Area , where  are any of 7, 8 or 11 | M1 |
|   using the value of their *C* from part (a) | A1 ft |
|  (from angle of either  | A1 **cso** |
|  |  | **(3)** |
|  |  | **(6 marks)** |
| **2(a)** |  In triangle *OCD* **complete method** used to find angle *COD*  so: Either or uses oe **so**  | M1 |
| ( ) = 0.906 (3sf) \* accept awrt 0.906 | A1 \* |
|  |  | **(2)** |
| **2(b)** |  Uses *s* = 8 for any  in radians or  for any  in degrees  | M1 |
|   or  and Perimeter = 23+( 16  )  | M1 |
|  accept awrt 40.9 (cm) | A1 |
|  |  | **(3)** |
| **2(c)** | Either Way 1: (Use of Area of two sectors + area of triangle) |  |
| Area of triangle = (or 25.1781155 accept awrt 25.2) or  or  after *h* calculated from correct Pythagoras or trig. | M1 |
| Area of sector =  (or 35.77535142 accept awrt 35.8 ) | M1 |
| Total Area = Area of two sectors + area of triangle =awrt 96.7 or 96.8 or 96.9 () | A1 |
|  |  | **(3)** |
|  |  | **(8 marks)** |
| **3(a)** | **Usually answered in radians: Uses** (m) (accept awrt 6.20) | M1 A1 |
|  |  | **(2)** |
| **3(b)** |   | M1 A1 |
|  |  | **(2)** |
| **3(c)** | Area of triangle = , =  (=awrt 4.1) | M1 A1 |
| Total area =  | M1 |
|  = 19.04 | A1cao |
|  |  | **(4)** |
|  |  | **(8 marks)** |
| **4(a)** | Length *DEA*  | M1A1 |
|  |  | **(2)** |
| **4(b)** | Angle *CBD* | M1 |
| **Both**  **and** or**Both**  **and** or**Both**  **and** **Or equivalents to these** | dM1 |
|  | ddM1 |
|  | Awrt 31.3 | A1 |
|  |  | **(4)** |
|  |  | **(6 marks)** |
| **5(a)** | Area *BDE*  | M1 |
|  | A1 |
|  |  | **(2)** |
|  | **Parts (b) and (c) can be marked together** |  |
| **5(b)** |  or  (or equivalent) | M1 |
|  | Angle  | awrt  | A1 |
|  |  | **(2)** |
| **5(c)** | **Note that candidates may work in degrees in (c)** **(**Angle ) |  |
| Area *CBD* |  |
| Angle **(Maybe seen on the diagram)** | Area *CBD* or awrt 15.2. (Note area of *CBD*)A correct method for the area of triangle *CBD* which can be implied by awrt 15.2 | M1 |
|  | M1 |
| or |  |
| Or | M1 |
| Area *EAB* | **d**M1 |
|  |  |
| awrt 38.9 | A1**cso** |
|  |  | **(5)** |
|  |  | **(9 marks)** |
| **6(a)** |  | Correct use of cosine rule leading to a value for cos α | M1 |
|  |  |
| *α* = 2.22 \* | Cso (2.22 must be seen here) | A1 |
| (NB *α* = 2.219516005) |  |
|  |  | **(2)** |
| **6(b)** |  |  or awrt 4.06  | B1 |
|  | Correct method for major sector area.  | M1 |
| 32.5 | Awrt 32.5 | A1 |
|  |  | **(3)** |
| **6(c)** | Area of triangle =  | Correct expression for the area of triangle *XYZ* | B1 |
| **So area required = “**9.56” + **“**32.5” | Their triangle *XYZ* + (part (b) answer or correct attempt at major sector) | M1 |
| = 42.1 cm2 or 42.0 cm2 | Awrt 42.1 or 42.0 (Or just 42) | A1 |
|  |  | **(3)** |
| **6(d)** |  Or  | M1:Or circumference – minor arc | M1A1ft |
|  | A1: Correct ft expression |  |
| Perimeter = *ZY* + *WY* + Arc Length | 9 + 2 + Any Arc | M1 |
|  Perimeter = 27.2 or 27.3 | Awrt 27.2 or awrt 27.3 | A1 |
|  |  | **(4)** |
|  |  | **(12 marks)** |
| **7(a)** |  (cm) | M1 A1 |
|  |  | **(2)** |
| **7(b)** |    | M1 A1 |
|  |  | **(2)** |
| **7(c)** | Let *AD* = *x* then  so *x* = 5.16 \*OR *x* = 3 / cos 0.95 OR so *x* = 3/ sin 0.62 so *x* = 5.16 \*OR  leading to *x* = , so *x* = 5.16 \* | M1 A1 |
|  |  | **(2)** |
| **7(d)** | Perimeter = ‘5.7’+5.16 +6 – 5.16= “11.7” **or 6 + their 5.7** | M1A1 ft |
|  |  | **(2)** |
| **7(e)** | Area of triangle *ABD* =  = 12.6 or  = 12.6 (½ base x height) or = 12.6 | M1 A1 |
|  So Area of *R* = ‘17.1’ – ‘12.6’ = 4.5 | M1 A1 |
|  |  | **(4)** |
|  |  | **(12 marks)** |
| **8(a)** | Mark (a) and (b) together. |  |
| **Usually answered in radians: Uses** either  **or**  or both | M1 |
|   | A1 |
|  | A1 |
|  or 262.6  | A1 |
|  |  | **(4)** |
| **8(b)** |  | M1 A1 |
|  | M1 |
|  | M1 |
|  | A1 |
|  |  | **(5)** |
|  |  | **(9 marks)** |

|  |  |  |  |  |  |
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|  | **Source paper** | **Question number** | **New spec references** | **Question description** | **New AOs** |
| 1 | C2 Jan 2011 | 2 | 5.1 | Trigonometry | 1.1b |
| 2 | C2 2015 | 4 | 5.1 | Trigonometry of triangle and circle | 1.1b, 2.1, 3.1a |
| 3 | C2 2017 | 4 | 5.1 | Trigonometry - arc length and area of sector, Area of triangle | 1.1b, 3.1b and 3.4 |
| 4 | C2 June 2014R | 5 | 5.1 | Arc length and sector area | 1.1b, 2.2a |
| 5 | C2 2014 | 5 | 5.1 | Arc length and sector area | 1.1b, 2.2a, 3.1 |
| 6 | C2 Jan 2013 | 7 | 5.1,  | Trigonometry | 1.1b, 2.2a, 3.1a |
| 7 | C2 Jan 2012 | 7 | 5.1 | Trigonometry | 1.1b |
| 8 | C2 2013 | 5 | 5.1 | Trigonometry | 1.1b, 3.1b |