## Module 2 Loci Answers

1) 

Angle bisector of angle in the middle
4
Second angle bisector drawn

W1 correct bisector drawn
W1 at least two arcs drawn on the arms and one pair of correct crossing arcs
W1 as above
W1 as above

Accuracy $\pm 1^{\circ}$ but line must go from edge to edge.
2)

| 4 (a) (i) | Accurate triangle with 2 arcs seen, 2 mm accuracy for lines AC and BC | B2 | SC1 if accurate but no arcs or one arc or if AC and $B C$ are wrong way round with arcs |
| :---: | :---: | :---: | :---: |
| (ii) | Accurate bisector of angle $\boldsymbol{A C B}, 2^{\circ}$ accuracy and both pairs of arcs shown (accept equidistant marks on edges for $1^{\text {st }}$ set of arcs) + must meet $A B$ | B2ft | Ft their triangle <br> SC1ft if accurate but no/one pair of arcs or short with arcs <br> In both (ii) and (iii) isw |
| (iii) | Accurate perpendicular bisector of $\boldsymbol{A D}$ 2 mm accuracy at mid-point and $2^{\circ}$ for right angle and shows both sets of arcs + must meet $A C$ | B2ft | ft their $D$, which must be on $A B$ <br> SC1ft if accurate but no/one pair of arcs or short with arcs |
| (iv) | Correct region shaded cao | B1 | Dependent on correct triangle, accurate bisectors of angle $A C B$ and side $A D$ with correct D |
| (b) (i) | $(\cos C)=\frac{140^{2}+180^{2}-240^{2}}{2 \times 140 \times 180}$ oe <br> - $0.111(1)$...or better or 96.37 to 96.38 | M2 E1 | $(-5600 / 50400 \text { or }-14 / 126)$ <br> Allow use of 7, 9 and 12 <br> M1 for correct implicit statement Verification using 96.4 scores M2 max Accept $-\frac{1}{9}$ but not a non-reduced fraction |
| (ii) | $0.5 \times 140 \times 180 \sin ($ their 96.4$)$ oe 12521 to 12523 or 12500 or 12520 cao www2 | $\begin{gathered} \text { M1 } \\ \text { A1 } \end{gathered}$ | $(\mathrm{s}=280)$, allow use of 7, $9 \quad(31.3 \ldots)$ |
| (iii) | $(\operatorname{Sin} B=) \frac{140 \sin (\text { their } 96.4)}{240}$ oe $\mathbf{3 5 . 4}$ or $\mathbf{3 5 . 4 2}$ to 35.44 cao www3 | $\begin{aligned} & \text { M2 } \\ & \text { A1 } \end{aligned}$ | Allow use of 7, 12 <br> M1 for correct implicit statement SC2 for correct answer by other method |

3) 

Perpendicular bisector of $A C$

## Bisector of angle $A$

Shaded region inside triangle and to left of perp bisector of $A C$ and above bisector of angle $A$

B1 accurate line
B1 two pairs of correct construction arcs
B1 accurate line
B1 two pairs of correct construction arcs
B1 dep on first B1 being scored for both lines
4)


2

2
B1 correct line B1 two sets of correct arcs

1
B1 correct line
B1 2 sets of correct arcs
correct region, shaded or shown by the letter R
5)

| 8 (a) | Arc centre $D$, radius 6 cm |
| ---: | :--- |
| (b) | (i) $\quad$Perp bisector of $A B$, with two pairs <br> of arcs <br> (ii) <br> Bisector of angle $B$, with arcs |
| (c) | (i) $\quad Q$ at intersection of loci <br> (ii) 2.7 cm to $2.9 \mathrm{~cm} \quad$ cao |
| (d) | Region inside arc, to left of perp bisector <br> and below angle bisector | and below angle bisector

At least 3 cm from $A B$. SC1 accurate without arcs or accurate arcs (but no choice)
At least 5 cm from $B$. SC1 accurate without arcs or accurate arcs (but no choice)

Dependent on at least both SC1's
Dependent on (c)(i)
Dependent on at least both SC1's in (b)
6)

Accurate ruled perp. bisector with correct intersecting arcs

Accurate ruled angle bisector with correct intersecting arcs

Compass drawn arc centre $F$ radius
5.5 cm long enough to enclose region

Correct region indicated cao

B1 for accurate with no/wrong arcs or M1 for correct intersecting arcs Ignore one extra perp. bisector

B1 for accurate with no/wrong arcs or M1 for correct intersecting arcs Ignore one extra angle bisector

M1 for compass drawn arc centre $F$ Accept dotty lines but not freehand for all three
7)

8)

(b)

1

Intention to draw a full correct circle
B1 for correct line, on each side of $A B$ (longer than dash at $C$ )
B1 for 2 pairs of intersecting arcs

R shaded must be a closed region

