

Geometric Constructions – Paper 4 – Mark Scheme

Question 1

5	(a) (i) Accurate perpendicular bisector, with 2 pairs of arcs, of CD .	2	SC1 if accurate without arcs.
	(ii) Accurate angle bisector, with two pairs of arcs, of angle A .	2	SC1 if accurate without arcs.
	(b) SHOP written in correct region	S1	Dependent on at least SC1 in (i) and (ii) and intersection
	(c) (i) Arc, centre B , radius 5cm, reaching across $ABCD$.	1	Allow good freehand
	(ii) Area outside their arc centre B and outside SHOP shaded	1ft	dep on S1

Question 2

8 (a)	Arc centre D , radius 6cm	1	
(b)	(i) Perp bisector of AB , with two pairs of arcs	2	At least 3 cm from AB . SC1 accurate without arcs or accurate arcs (but no choice)
	(ii) Bisector of angle B , with arcs	2	At least 5 cm from B . SC1 accurate without arcs or accurate arcs (but no choice)
(c)	(i) Q at intersection of loci	1	Dependent on at least both SC1 's
	(ii) 2.7cm to 2.9 cm cao	1	Dependent on (c)(i)
(d)	Region inside arc, to left of perp bisector and below angle bisector	1	Dependent on at least both SC1 's in (b)

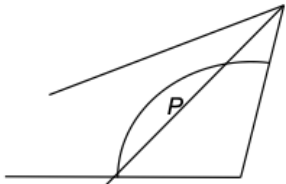
Question 3

9	Accurate ruled perp. bisector with correct intersecting arcs	2	B1 for accurate with no/wrong arcs or M1 for correct intersecting arcs Ignore one extra perp. bisector
	Accurate ruled angle bisector with correct intersecting arcs	2	B1 for accurate with no/wrong arcs or M1 for correct intersecting arcs Ignore one extra angle bisector
	Compass drawn arc centre F radius 5.5 cm long enough to enclose region	2	M1 for compass drawn arc centre F
	Correct region indicated cao	1	Accept dotted lines but not freehand for all three

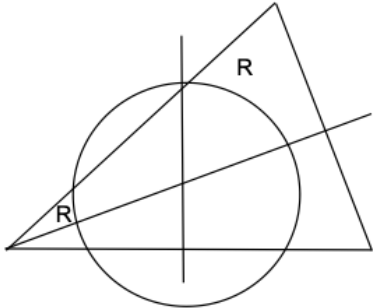
Question 4

2	(a)	(i)	Perpendicular bisector of QR ruled with 2 correct sets of arcs centred Q and R	2	B1 for correct bisector ruled
			Bisector of angle SPQ ruled with correct arcs. (Marks on PS and PQ and correct pair of arcs)	2	B1 for correct angle bisector ruled
			Compass drawn arc centre R with radius 6 cm (± 2 mm)	B2	B1 for any compass drawn arc centre R not used in any construction with no feathering
			Correct region shaded cao	1dep	Dependent on all B4 marks for the correct loci
		(ii)	217 to 221	1	
	(b)	(i)	6360 or 6361 to 6363	2	M1 for $\pi \times 45^2$
		(ii)	165 or 164.9 to 165	2	M1 for $\frac{210}{360} \times 2\pi \times 45$

Question 5

10	(a)		475 or 465 to 485	2	B1 for 9.3 to 9.7 [cm] seen
		(b)	Correct perpendicular bisector with two pairs of intersecting arcs	2	B1 for accurate with no/wrong arcs or M1 for correct intersecting arcs
		(c)	Compass drawn arc centre B radius 5.8	2	M1 for compass drawn arc centre B or B1 for 5.8 cm stated or used
			Accurate angle bisector at C with correct intersecting arcs	2	B1 for accurate with no/wrong arcs or M1 for correct intersecting arcs
				1	cao

Question 6

2	(a)	Correct perpendicular bisector of AB with 2 pairs of correct arcs isw	2	B1 for accurate with no/wrong arcs or M1 for correct intersecting arcs with no or wrong line
	(b)	Correct angle bisector at A with two pairs of correct arcs isw	2	B1 for accurate with no/wrong arcs or M1 for two pairs of correct arcs with no or wrong line
	(c)	Circle centre E radius 5 cm isw	2FT	FT circle centre <i>their</i> E radius 5 cm provided (a) and (b) attempted M1 for $250 \div 50$ oe soi e.g. from arc If 0 scored SC1 for circle centre <i>their</i> E
	(d)		2	cao B1 for each If 0 scored, SC1 for two 'correct' regions but in part (c), centre correct but radius incorrect

Question 7

2(a)(i)	9		1	
2(a)(ii)	$ABCD$ completed accurately with arcs		2	M1 for intersecting arcs radius <i>their</i> 9 cm or for $ABCD$ completed accurately with no arcs
2(b)	Correct ruled perpendicular bisector of AB with 2 correct pairs of arcs Correct ruled bisector of angle ABC with 2 correct pairs of arcs Lines intersecting		4	B2 for correct ruled perpendicular bisector of AB with 2 correct pairs of arcs or B1 for correct perpendicular bisector without/wrong arcs and B2 for correct ruled bisector of angle ABC with 2 correct pairs of arcs or B1 for correct bisector of angle ABC without/wrong arcs If lines do not intersect, max B3