

**LOCI AND CONSTRUCTION**

**OCR – Tuesday 03 November 2020- Morning - Paper 1 (Calculator) Foundation Tier**

1.

23	(a)	Accurate ruled angle B bisector with two pairs of correct arcs	2	B1 for accurate ruled angle B bisector	Tolerance $\pm 2^\circ$ e.g. one angle $49^\circ$ to $53^\circ$ and the line can be any length, must touch B and condone dotted line
	(b)	Accurate ruled perpendicular bisector of BC with two pairs of correct arcs	2	B1 for accurate ruled perpendicular bisector of BC	Tolerance $\pm 2^\circ$ e.g. angle $88^\circ$ to $92^\circ$ and $\pm 2\text{mm}$ e.g. 27mm to 31 mm and line can be any length, must touch BC and condone dotted line
	(c)	Correct region shaded	1 dep	dep on at least B1 and B1 and both bisectors intersecting	

**OCR Thursday 07 November 2019- Morning (Non-Calculator) Foundation Tier**

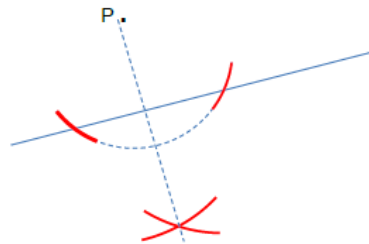
2.

17		Line drawn parallel to AB, 1.8 to 2.2 cm away that meets AD and <i>their</i> bisector of angle BCD	M1		Condone dotted lines throughout Use overlay as a guide If no angle bisector <i>their</i> horizontal line must at least touch the left hand boundary of angle bisector overlay
		Bisector of angle BCD drawn with correct arcs	M2	M1 for correct bisector with no/incorrect arcs	$\pm 2^\circ$
		Arc centre D with radius 2.8 to 3.2 cm	M2	M1 for any arc centre D	Arc must meet AD and DC for 1 or 2 marks
		Correct region shaded	A1	Dep on M1 M1 M2	Accept region clearly identified

**OCR Tuesday 11 June 2019 – Morning (Calculator) Foundation Tier**

3.

22		Ruled perpendicular constructed with correct arcs (one pair intersecting AB)	2	Condone dashed line B1 for correct arcs (one pair intersecting AB) only but no line or correct ruled line but no, or incomplete construction arcs	<p>Set protractor to <math>90^\circ</math> and check <math>88^\circ</math> to <math>92^\circ</math> at AB</p> <p>Correct construction arcs as shown (may be two pairs of arcs used to draw line through P) Ignore other arcs if correct arcs clearly used to construct line</p> <p>Condone perpendicular extending beyond AB but must pass through P and reach AB (no daylight)</p> <p><b>Alternative arcs.</b> One centred on A length AP and one centred on B length BP meeting below AB (may also pass through P). Use overlay as check</p> <p>Candidates may use points on AB other than A and B for this construction. In such cases check radii of arcs using on-line ruler to judge.</p>
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OCR Tuesday 6 November 2018 – Morning (Calculator) Foundation Tier

4.

19		Arc centre D radius 6 cm meeting AD and DC or DC and bisector of ABC	2	B1 for any arc centre D	Accept dashed or dotted for all marks Arc must be complete within ABCD not freehand  Allow beyond AD and DC for 1 or 2 marks Tolerance 5.8 to 6.2 cm  Tolerance $\pm 2^\circ$
		Ruled bisector of angle ABC to reach DC with construction arcs or Bisector with construction arcs from ABC to <i>their</i> arc centre D	2	B1 for correct ruled bisector at least 2cm long by eye with no construction arcs	
		Correct region shaded	1	Dep on B2 and at least B1	

OCR Monday 12 November 2018 – Morning (Calculator) Foundation Tier

5.

15		Correct ruled line with two pairs of correct arcs	2	B1 for correct ruled line but no or wrong arcs or correct intersecting arcs no line	Arcs may be two continuous arcs centred at F and G with two intersections Anchor overlay on G. Line to be within overlay throughout. May be all on one side of FG only
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OCR Monday 24 May 2018 – Morning (Calculator) Foundation Tier

6.

20	(a)	Accurate angle bisector with 2 pairs of correct arcs	2	B1 for correct bisector with no arcs or incorrect arcs	The bisector does not have to go through A but if extended it must go through A and it must lie within green lines in overlay. For 2 marks condone intersecting arcs of equal radius, one centre B and the other centre C for the construction with bisector drawn. For arc, measure radius using ruler.  tolerance $\pm 2$ mm and $\pm 2^\circ$ for both constructions
		Arc centre C radius 7cm  Correct region indicated	2  1Dep	B1 for arc centre C with incorrect radius  Dependent on at least B1 for bisector and B2 for arc	
	(b)	accept any correct assumption e.g. Road[s] is not/are not straight, road AB is busier than road AC, land is not suitable for construction	1		If more than one choose the best one see list of exemplars

**OCR Thursday 2 November 2017– Morning (Calculator) Foundation Tier**

7.

20	(a)		Accurate perpendicular bisector from at least AB passing within 3cm of C with two pairs of correct arcs	2	B1 for accurate perpendicular bisector	Tolerance $\pm 2\text{mm}$
			Arc centre C, at least from BC to CD with radius 3 cm	2	B1 for any arc centre C	
			Two correct points marked intersecting the line and the arc	1	Dep on B1 (bisector) and B2 (arc) scored above	
	(b)		One of the points is not in his garden or only one is in his garden	1	accept any correct reason e.g. one point is behind the CD fence	

**OCR Wednesday 8 November 2017– Morning (Calculator) Foundation Tier**

8.

18	(a)		Correct ruled line reaching AB and two pairs of correct arcs	2	B1 for correct ruled line reaching AB without all arcs or correct ruled line with arcs but short	Tolerance $\pm 2^\circ$
	(b)	(i)	Correct ruled line reaching AD through E and two pairs of correct arcs	2	B1 for correct ruled line reaching AD without all arcs or correct ruled line with arcs but short or perpendicular ruled line from BC to another side	Tolerance $\pm 2^\circ$
		(ii)	118 to 122	2	Strict FT for all marks. Follow through <i>their</i> straight line in (b)(i) from entrance to another side  B1 for <i>their</i> 11.8 to 12.2 [cm]	Use ruler and measure to 2 mm accuracy

OCR Thursday 25 May 2017 – Morning (Calculator) Foundation Tier

9.

16			<p>Complete correct arc centred at B identified with full construction shown including either perpendicular bisector of AB (including arcs and intersecting the arc centred at B) or arc(s) of 5cm radius centred at A and intersecting the arc from B at 2 points</p>	5	<p><b>B4</b> 5cm arc centred at B with full construction shown including either perpendicular bisector of AB (including arcs and intersecting the arc centred at B) or arc(s) of 5cm (<math>\pm 0.2</math> cm) radius centred at A and intersecting the arc from B at 2 points</p> <p>OR</p> <p><b>B2</b> for complete arc 5cm (<math>\pm 0.2</math> cm) centred at B or <b>B1</b> for arcs 5cm (<math>\pm 0.2</math> cm) radius centred at B or continuous arc 5cm (<math>\pm 0.2</math> cm) radius centred at B, but not covering the whole of the required region, minimum span 30°</p> <p>AND</p> <p><b>B1</b> for arc[s] centred at A radius 5cm (<math>\pm 0.2</math> cm) or a perpendicular bisector of AB</p> <p>OR</p> <p><b>B1</b> for minimum of 3 points in the correct position without arc from B</p>	<p><b>B4</b> is fully correct without the correct locus identified</p> <p>Complete arc for the region required</p>
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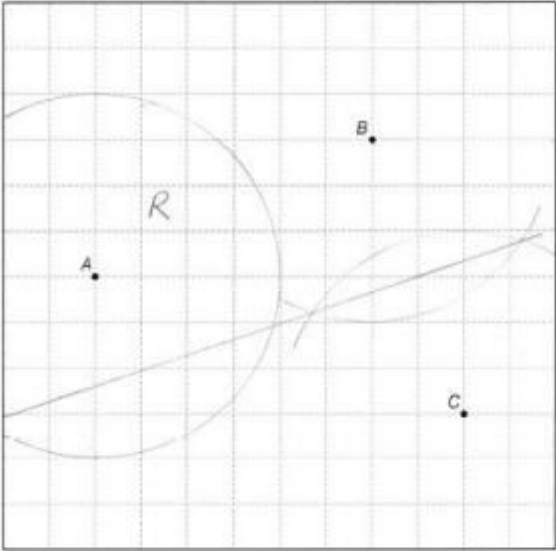
OCR Tuesday 13 June 2017 – Morning (Calculator) Foundation Tier

10.

17	(a)	(i)	9.6	1		
		(ii)	2500	1		Condone 1 : 2500
	(b)		<p>Arc centre B radius 6 cm meeting AB and CB or AB and bisector of ADC</p> <p>Ruled bisector of angle ADC to reach BC with construction arcs or Bisector with construction arcs from BC to <i>their</i> arc centre B</p> <p>Correct region shaded</p>	<p>2</p> <p>2</p> <p>1</p>	<p><b>B1</b> for any arc centre B meeting AB and BC or short arc (at least 1cm) radius 6 cm centre B</p> <p><b>B1</b> for correct ruled bisector at least 2cm long by eye with no construction arcs or correct construction arcs with no bisector drawn</p> <p><b>Dep</b> on <b>B1</b> and <b>B1</b></p> <p>If 0 scored <b>SC1</b> for 6 [cm] [= 150] [m] seen</p>	<p>Accept dashed or dotted for all marks Freehand, all within template, max <b>B1</b> Allow beyond AB and BC for 1 or 2 marks Tolerance 5.8 to 6.2 cm</p> <p>Tolerance <math>\pm 2^\circ</math></p> <p>Construction arcs on AD and on DC and two intersecting arcs from these</p>

AQA Thursday 6 June 2019 – Morning (Calculator) Foundation Tier

11.

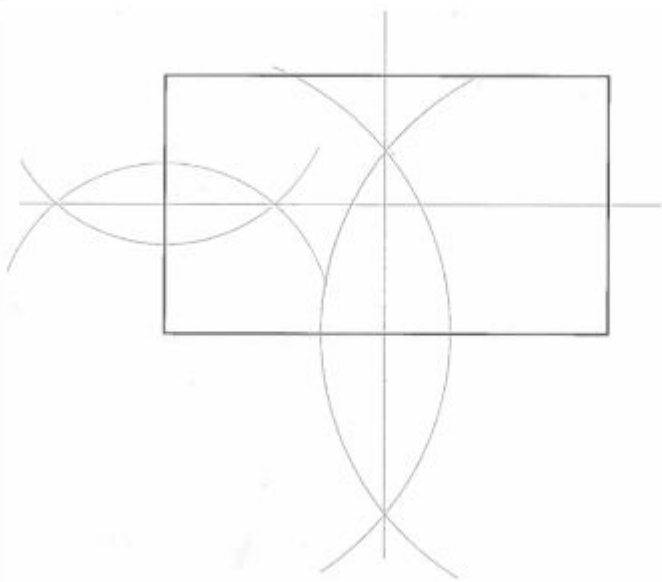
	Arc, centre A, radius 4 cm on grid	B1	at least a quarter-circle $\pm 2$ mm radius ignore any other arcs
	Correct straight line equidistant from B and C	B1	their line must intersect any two of the five grid vertices (0, 3), (3, 4), (6, 5), (9, 6), (12, 7) $\pm 2$ mm
	Correct enclosed region identified	B1	$\pm 2$ mm for the line at (0, 3), (6, 5) and the arc at (6, 6), (2, 10) region may be identified by labelling R or by shading implies B3
	<b>Additional Guidance</b>		
20			B1B1B1
	Arc must be drawn using compasses for the first and third marks		
	If a quarter-circle is in tolerance, ignore the rest of the arc for first B1		
	Grid points are based on the origin being bottom left		
	Use (6, 5) not the intersection of the arc and the line to test the region		
	Lines may be dotted		

AQA Thursday 2 November 2017 – Morning (Non-Calculator) Foundation Tier

12.

<b>21a</b>	The arcs should be drawn from C or from points the same distance from C or The lines are different lengths, so you can't go from the ends	B1	oe
	<b>Additional Guidance</b>		
	CB ≠ CD		B1
	Not drawn an arc from C		B1
	He put compass in wrong place. He should have started at C but he started at B and D		B1
	Should be an arc on each line CB and CD		B0
	Arcs in wrong place		B0
	Arcs aren't equal		B0
	His line isn't in the centre of B and D		B0
	D has a longer line than B		B0
	Arcs aren't the same radius		B0
	Should be an arc from B to D		B0
	Should be an arc from B to the line CD		B0
Should be an intersection on CB and CD		B0	

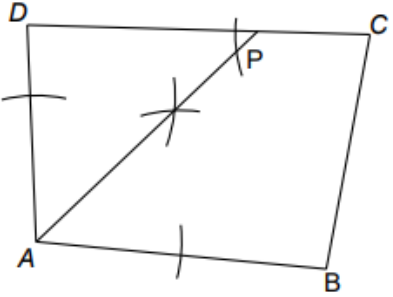
<b>21b</b>	It should be a circle, (not a square) or The corners are too far away	B1	oe eg accept circle constructed inside square, touching at midpoints of square to within 2mm
	<b>Additional Guidance</b>		
	A correct diagram takes precedence over statements, otherwise ignore diagram		
	Any distances if quoted, eg to corners, should be accurate to within 2mm		
	Ignore any reference to the top point P		
	The corners are more than 3 (km or cm) away from the point	B1	
	Some points are more than 3 (km or cm) away	B1	
	It isn't 3 (km or cm) to the corners	B1	
	Each corner is [4.1, 4.5] (km or cm) from P (values represent tolerance)	B1	
	Each corner is more than 4 away	B1	
	It should be a circle	B1	
	Each point is 4.2 km from P (not true)	B0	
	The corners of the square are 4 km (out of tolerance)	B0	
	The corners of the square are 4 km while the rest are 3 km	B0	
	Each corner will be more than 1 km away	B0	
	She's measured 3 cm from P without checking the corners	B0	
	It is not supposed to be this shape (but what should it be?)	B0	
	She has measured 4.3 km not 3 (not stated corners)	B0	
	She hasn't shown all the points that represent 3 km	B0	
	She hasn't plotted where all the 3 km points are	B0	
It shouldn't be a square	B0		

	One pair of equal, intersecting arcs from the vertices of one side of the rectangle	M1	tolerance $\pm 1$ mm
	Fully correct construction of line of symmetry with either two pairs of equal, intersecting arcs from the vertices of the same side of the rectangle or one pair of equal, intersecting arcs from the vertices of one side of the rectangle and the diagonals drawn	A1	tolerance $\pm 1$ mm  line of symmetry may be solid or dashed but must touch opposite sides of rectangle
<b>Additional Guidance</b>			
	Correct line with no appropriately constructed arcs		MOA0
<b>21c</b>			



AQA Sample Paper 3– Morning (Calculator) Foundation Tier

13.

<b>23</b>	<p>One continuous arc, centre <i>A</i>, intersecting <i>AB</i> and <i>AD</i></p> <p>or</p> <p>Two arcs, each with same radius and centre <i>A</i>, intersecting <i>AB</i> and <i>AD</i></p>	M1	<p>Allow <math>\pm 2</math> mm for radii</p>
	<p>Intersecting arcs with same radius and centres at the intersections with <i>AB</i> and <i>AD</i></p> <p>and</p> <p>angle bisector drawn</p>	A1	<p>Allow <math>\pm 2</math> mm for radii</p> <p>The radius of these arcs need not be the same as those used for M1</p>
	<p>Arc of radius [5.8, 6.2] cm, centre <i>C</i>, intersecting their angle bisector and <i>P</i> labelled</p> 	B1ft	<p>SC1 Arc of radius [5.8, 6.2] cm, centre <i>C</i> with no angle bisector attempted</p>