CONSTRUCTION

HIGHER AND FOUNDATION

Q1.

Use ruler and compasses for this question.

A ship is closer to port X than port Y less than 11 km from Y.

The map below shows the positions of X and Y.

On the map, show the region where the ship could be. Label it *R*.





Q2.

Use ruler and compasses to answer this question.

Point P is

- the same distance from AB and AD
- 6 cm from C.



Show the position of *P* on the diagram.

Q3.

The diagram shows a sketch of triangle ABC.



Using ruler and compasses only, make an accurate drawing of triangle ABC.

Q4.

Use these steps to construct a circle passing through the vertices of the triangle ABC.



- Construct the perpendicular bisector of *AB*.
- Construct the perpendicular bisector of *AC*.
- Use the point of intersection of the bisectors as the centre of the circle.
- Draw the circle through *A*, *B* and *C*.

Show your construction arcs clearly.



Q5.

ABCD is a kite.

Not drawn accurately



Using a ruler and compasses, make an accurate construction of the kite.

AC has been drawn for you.



Q6.

The scale drawing shows a post which is 1.5 metres from the fence.



Q7.

You will need a ruler and a pair of compasses to answer this question.

The diagram shows a plan of a garden. The hedge *DE* is 20 metres long.



A tree is to be planted so that it is

20 metres from D

and the same distance from the wall as from the fence.

Construct the position of the tree on the plan.

Mark schemes

Q1.

Pair of intersecting arcs, equal radii > half XY, above and below XY	M1	
Perpendicular bisector of XY drawn with correct construction	4.1	
	AI	
Arc, centre Y, radius [5.3, 5.7] cm	B1	
Correct region identified		
ft region to left of their perpendicular		
bisector and inside their arc		
	B1ft	
		[4]

Q2.

One continuous arc, centre A, intersecting AB and AD or Two arcs, each with same radius and centre A, intersecting AB and AD Allow ± 2 mm for radii M1

Intersecting arcs with same radius and centres at the intersections with AB and AD and

angle bisector drawn

Allow $\pm 2 \text{ mm}$ for radii The radius of these arcs need not to be the same as those used for M1

M1

Arc of radius [5.8, 6.2] cm, centre C, intersecting their angle bisector and P labelled



SC1 Arc of radius [5.8, 6.2] cm, centre C with no angle bisector attempted

B1ft

Q3.

Triangle is correct with two equal arcs seen for angle of 60 B2 Triangle correct but no arcs

[3]

B2 Fully correct constructions (3^{rd} side missing) B1 for either AB = [7.4, 7.6] or AC = [6.2, 6.4] or 60°

Q4.

Fully correct construction with circle in tolerance and all arcs shown

B3 Fully correct except using one pair of arcs and midpoint construct perpendiculars to B3 Perpendiculars fully correct with arcs intersecting in two and no circle or circle out of tolerance places B2 Using one pair of arcs and midpoint to construct perpendiculars, no circle or circle out of tolerance B2 No arcs, two perpendiculars correct and circle in tolerance B2 One perpendicular fully correct with arcs intersecting in places two B1 No arcs, two perpendiculars correct and no circle or circle out of tolerance

B4 [4]

Q5.

Alternative method 1

A pair of intersecting arcs of radii 4 cm	M1
A pair of intersecting arcs of radii 8 cm	M1
Fully correct kite drawn with all arcs shown SC1 for a complete kite within tolerance	A1
Alternative method 2 (perpendicular bisector)	
Two pairs of intersecting arcs of equal radii greater than 3 cm	M1
Perpendicular bisector constructed	ldep
Fully correct kite drawn with at least one arc of radius 4 cm and one arc of radius 8 cm SC1 for a complete kite within tolerance	A1

Additional Guidance

Kite may be drawn inverted

[3]

B3

[3]

Q6.	
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-	(a)	2 or 2.0	B1
	(b)	Circular arc drawn centre post	M1
		Fully correct arc radius 5 cm ± 2 mm tolerance	A1
	(c)	2 cm = 1 metre	
		Any equivalent scale	
		or 1 cm = 0.5 metre Condone 1 square = 0.5 metre	M1
		1 cm = 50 cm or 2 cm = 100 cm Any order	
		or 2:100	
		Common units	M1
		1 : 50 <i>50 : 1 implies M1M1A0</i>	A1
Q7			
	Arc or Ar	drawn from intersection of wall and fence cutting wall and fence rc drawn from D radius hedge length	M1
	Com	plete angle bisector with all construction arcs	A1
	Point	t marked in correct place, with all arcs for both constructions shown May be indicated by intersection of angle bisector and arc SC1 Point marked in correct place but no arcs	A1
	Addi Tree	itional Guidance need not be labelled	

[3]

[6]