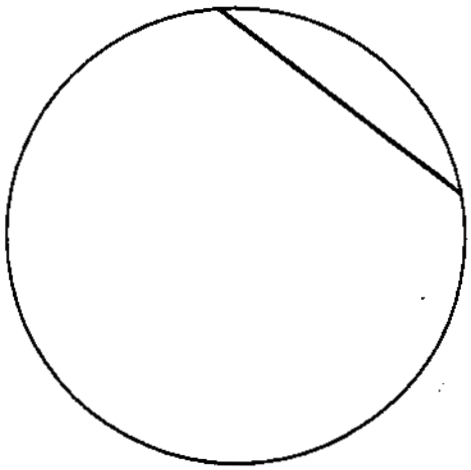
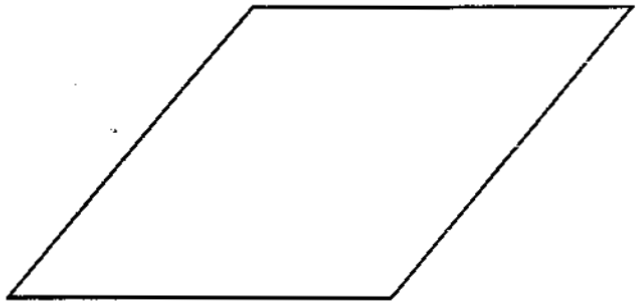
Question 1

A map has a scale of 1 : 250 000. Complete the statement below.

1 centimetre on the map represents ..... kilometres on the ground. [1]

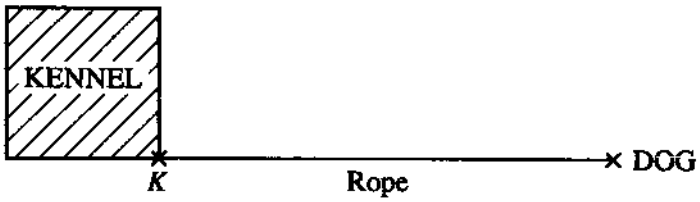
Question 2





Draw any lines of symmetry on each of the diagrams above. [2]

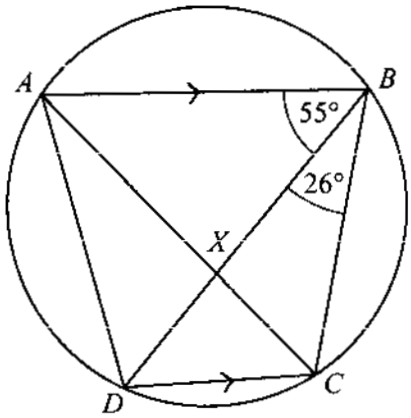
Question 3



A dog is tied to one corner (K) of a fixed square kennel by a rope. This is shown in the scale diagram above.
Draw accurately on the diagram the path of the dog as it moves **anticlockwise** around the kennel with the rope always tight. [3]

Question 4

ABCD is a cyclic quadrilateral in which *AB* is parallel to *DC*.
The diagonals *AC* and *BD* meet at *X*.
Angle *ABD* = 55° and angle *DBC* = 26°.



NOT TO SCALE

Work out

(a) angle *BCD*,

Answer (a) angle *BCD* = ... [1]

(b) angle *BXC*,

Answer (b) angle *BXC* = ... [1]

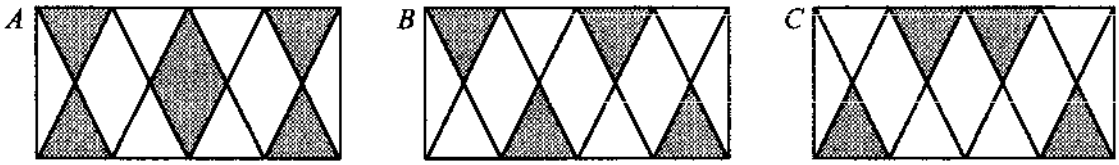
(c) angle *ADB*.

Answer (c) angle *ADB* = ... [1]

Question 5

(a) Which of the diagrams below does not have rotational symmetry?

Answer (a) ..... [1]



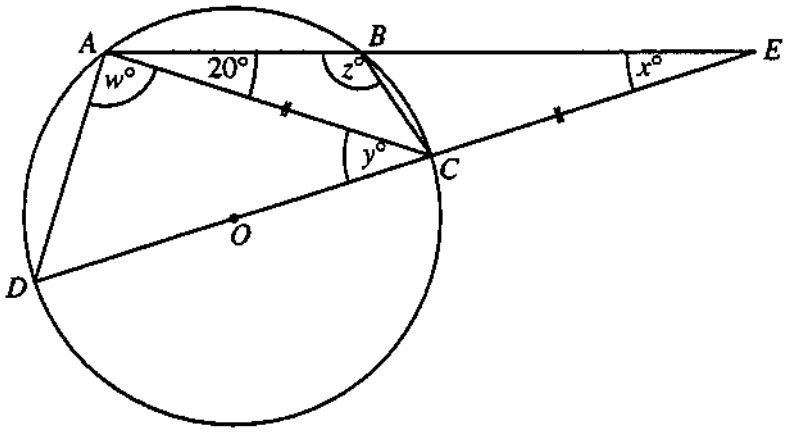
(b) Draw any lines of symmetry on each of the three diagrams above.
If a diagram has no line of symmetry, write NONE underneath it. [3]

Question 6

By construction, using ruler and compasses only, find the region which contains all the points which are less than 4 cm from P **and** nearer to P than to Q.
Shade this region.

[4]

Question 7



NOT
TO
SCALE

The centre of the circle $ABCD$ is O.
ABE and $DOCE$ are straight lines.
$AC = CE$ and angle $BAC = 20°$.
Find the values of w, x, y and z.

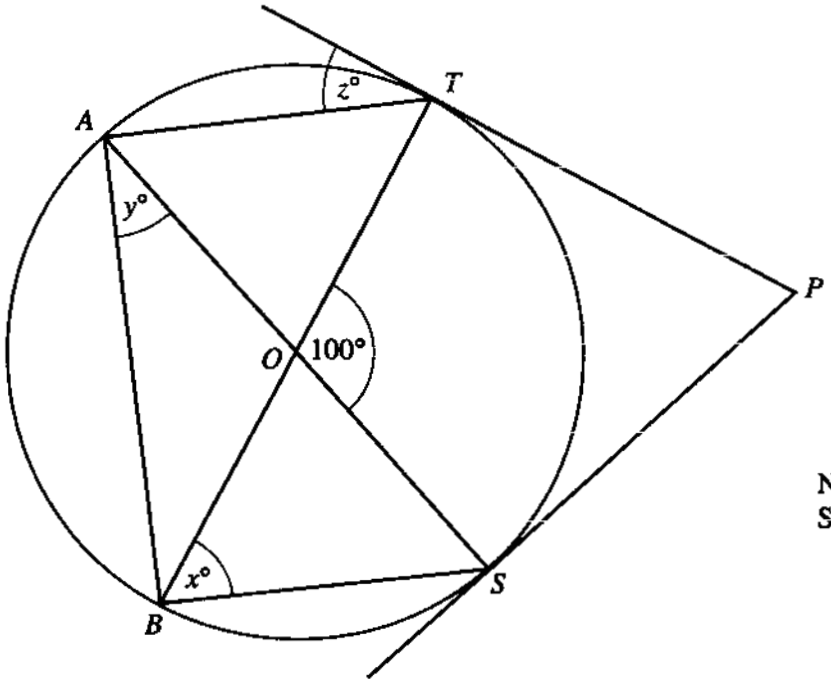
Answer w = ... [1]

x = ... [1]

y = ... [1]

z = ... [1]

Question 8



NOT TO SCALE

PT and *PS* are tangents to a circle centre *O*. *TOB* and *AOS* are diameters and angle *TOS* = 100°.

(a) Find the values of *x*, *y* and *z*.

Answer (a) x = ... [1]

y = ... [1]

z = ... [1]

(b) Is *AS* parallel to *TP*? Give a reason for your answer.

Answer (b) ..... [1]

Question 9

(a) Construct triangle *ABC* with *BC* = 10 cm, *AB* = 9 cm and *AC* = 7 cm. [2]

(b) Using a straight edge and compasses only, construct the perpendicular bisectors of *BC* and *AC*. Label their point of intersection *O*. [3]

(c) Draw perpendicular lines from *A* to *BC* and from *B* to *AC*. Label their point of intersection *H*. [2]

(d) Draw the line *OH* and label its mid-point *N*. [1]

(e) *M* is the mid-point of *BC*. Mark the point *M* on your diagram. Draw the line through *M* and *N* to meet *AH* at *U*. [1]

(f) What do you notice about the lengths *AU*, *UH* and *OM*? [1]

(g) What can you say about triangle *OMN* and triangle *HUN*? [1]

(h) With *N* as centre, draw a circle with radius *NM*. Measure and write down this radius. [2]

Question 10

Answer the whole of this question on a sheet of graph paper.

(a) Using a scale of 1 centimetre to represent 1 unit on each axis, draw an x-axis for $-6 \leqslant x \leqslant 10$ and a y-axis for $-2 \leqslant y \leqslant 12$.

Mark the points A (–6, 1), B (–3, 10) and C (9, 6).
Draw the triangle ABC. [2]

(b) Construct the locus of points

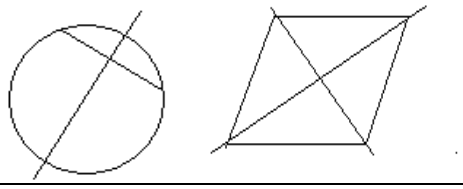
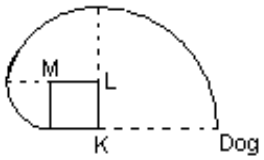
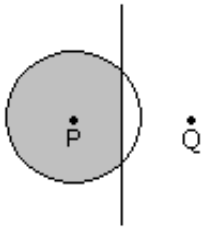
(i) 7 cm from A and inside triangle ABC, [2]

(ii) equidistant from B and from C, [2]

(iii) equidistant from BC and from AC. [2]

(c) Shade the region inside triangle ABC which is less than 7 cm from A and nearer to BC than to AC.
Label this region R. [2]

(d) Shade the region inside triangle ABC which is nearer to C than to B and nearer to BC than to AC.
Label this region S. [2]

QUESTION	ANSWER	MARK	
1	$2\frac{1}{2}$ or 2.5	1	Ignore any zeros if decimal point clear
2		1, 1	One mark for each correct diagram
3		1 1 1	¼ circle, radius 6 cm, centre K ¼ circle, radius 4 cm, centre L ¼ circle, radius 2cm, centre M (SC2) for correct idea, compasses not used
4 (a)	99°	1	
(b)	110°	1	
(c)	44°	1	√ award (B1) for 154 – (b)
5 (a)	C	1	
(b)	A 1 vertical in middle, 1 horizontal in middle B none C 1 vertical in middle	1 1 1	Both must be drawn for 1 mark Must be stated
6		4	(B1) for circle centre P radius 4 ± 0.1 cm (B1) for construction of perpendicular bisector (B1) for correct position ± 0.1cm, ±1° (B1) for shading dependent upon reasonable circle & line
7	w = 90° x = 20° y = 40° z = 130°	1 1 1 1	√ award (B1) for 20 + 'his' x
8 (a)	x = 50° y = 40° z = 40°	1 1 1	
(b)	No, since angleSAT = 50° and z = 40°	1	Any valid comment
9 (a)	Construct triangle with lengths accurate to 2mm	2	Labels must be correct
(b)	Perpendicular bisector of BC with arcs Perpendicular bisector of AC with arcs O marked where bisectors meet	1 1 1	Accuracy 2 mm, 2° (√ using 'his' triangle) Accuracy 2 mm, 2° (√ using 'his' triangle) Must be right angle bisectors, **not** medians etc.
(c)	Perpendicular from A accurate (by eye) Perpendicular from B accurate (by eye)	1 1	} Should look parallel to perpendicular bisectors (√)
(d)	N marked correctly on OH (midpoint)	1	√ using 'his' O and H. N must be **within** the triangle

QUESTION	ANSWER	MARK	
(e)	U marked correctly where MN meets AH	1	√ using 'his' MN & AH. U can be at A, but **not** outside triangle
(f)	AU ≈ UH ≈ OM (1cm to nearest cm)	1	
(g)	Similar, possibly congruent or equivalent	1	Rotationally symmetrical or equivalent
(h)	Circle centre N, radius NM 2.5 – 2.7 cm	1 1	 √ using 'his' N and M.
10 (a)	Scales correct Triangle ABC correctly drawn and at least 2 letters correctly labelled	S1 T1	-6 ≤ x ≤ 10 and 0 ≤ y ≤ 10 Accuracy 1 small square
(b)(i)	Arc drawn, centre A 7 cm radius	M1 A1	√ using 'his' A √ using 'his' A. Through (0, 4.6) if correct
(b)(ii)	Line through midpoint of BC Perpendicular to BC	M1 A1	√ using 'his' BC. Through (3, 8) if correct √ using 'his' BC. Through (2, 5) if correct
(b)(iii)	Angle bisector of angle C attempted within 2mm of (0, 6)	M1 A1	√ using 'his' angle C.
(c)	R in correct area	B2	√ using (b)
(d)	S in correct area	B2	√ using (b)

TYPES OF MARK

Most of the marks (those without prefixes and 'B' marks) are given for accurate results, drawings or statements.
'M' marks are awarded for any correct method applied to the appropriate numbers.
'B' marks are given for a correct statement or step.
'A' marks are for accurate results or statements but are awarded only if the relevant 'M' marks have been earned.
'SC' marks are awarded in special cases.
The symbol '√' indicates that a previous error is to be 'followed through' i.e. the mark can be gained if the candidate has made no further error in obtaining the relevant result.