

Question 1

The scale of a map is 1 : 40 000 000.

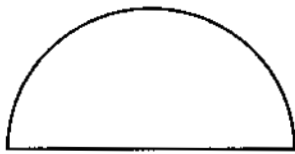
On the map the distance between Caracas (Venezuela) and Rio de Janeiro (Brazil) is 11.1 cm.

Calculate the actual distance between these two cities.

Give your answer in kilometres.

Answer km [2]

Question 2



P



Q

(a) Write down the number of lines of symmetry of each shape.

Answer (a) Shape P [1]

Shape Q [1]

(b) Write down the order of rotational symmetry of shape Q.

Answer (b) [1]

Question 3

(a) In the space below construct

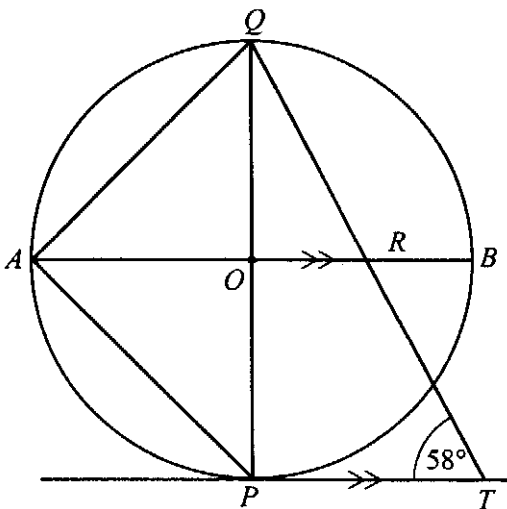
- (i) the locus of points which are 3 centimetres from A ,
- (ii) the locus of points which are equidistant from A and B .



[2]

(b) Find the two points on the diagram which are both 3 centimetres from A and 3 centimetres from B . Label them P and Q . [1]

Question 4



NOT TO SCALE

PT is a tangent to the circle, centre O .
 The diameter AOB is parallel to PT .
 POQ is a diameter.
 QT and AB meet at R .
 Angle $PTQ = 58^\circ$.

Write down the size of

(a) angle PQT ,

Answer (a) angle $PQT = \dots\dots\dots$ [1]

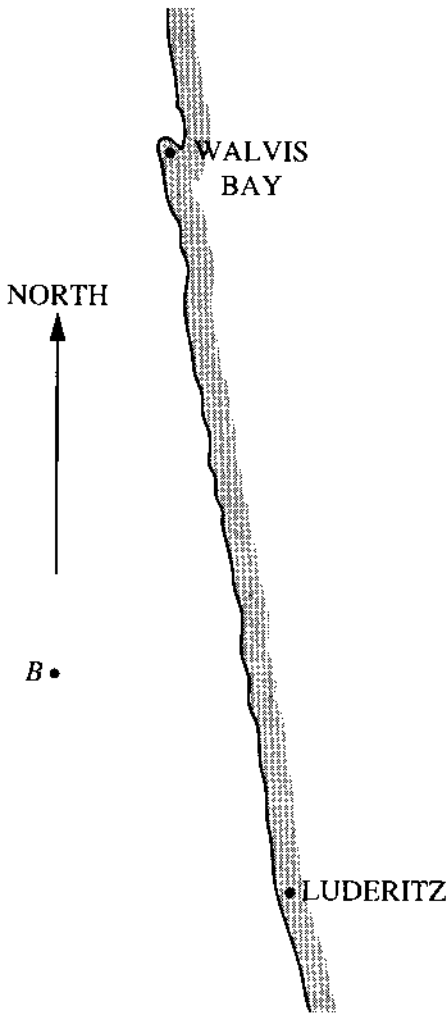
(b) angle PAQ ,

Answer (b) angle $PAQ = \dots\dots\dots$ [1]

(c) angle ORT .

Answer (c) angle $ORT = \dots\dots\dots$ [1]

Question 5



A boat *B* is at sea near the coast of Namibia.
The diagram is drawn to scale.

(a) Measure the bearing from the boat of

(i) Walvis Bay,

Answer (a)(i) [1]

(ii) Luderitz.

Answer (a)(ii) [1]

(b) The straight line distance from Walvis Bay to Luderitz is 500 km.

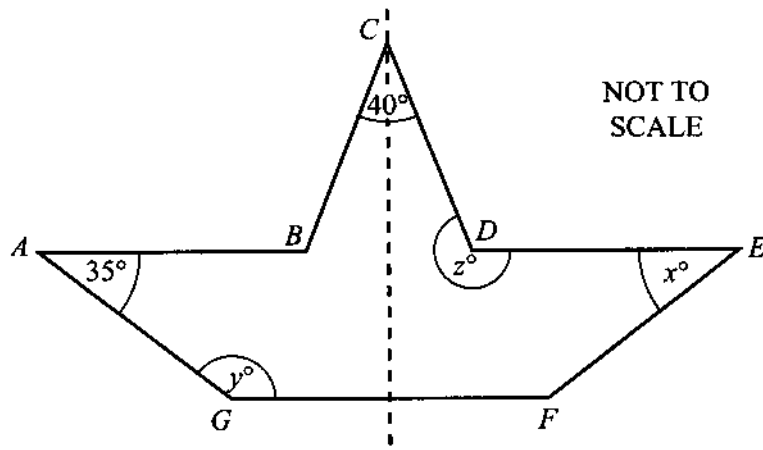
(i) What is the scale of the diagram?

Answer (b)(i) 1 cm representskm [1]

(ii) Find the distance of the boat from Luderitz.

Answer (b)(ii)km [1]

Question 6



The shape $ABCDEFG$ has a line of symmetry, shown in the diagram.
 AB and DE are parallel to GF .
 Angle $GAB = 35^\circ$ and angle $BCD = 40^\circ$.

Calculate the value of

(a) x ,

Answer (a) $x = \dots\dots\dots$ [1]

(b) y ,

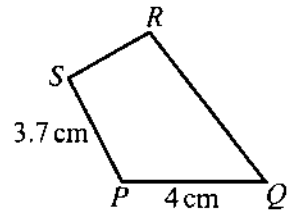
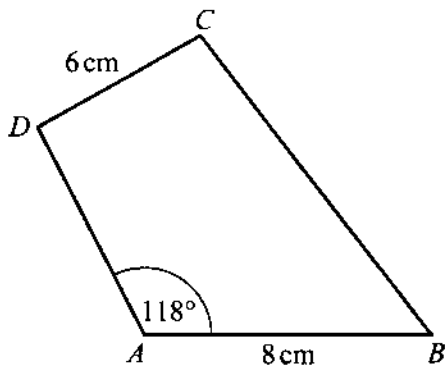
Answer (b) $y = \dots\dots\dots$ [1]

(c) z .

Answer (c) $z = \dots\dots\dots$ [2]

Question 7

(a)



The quadrilaterals $ABCD$ and $PQRS$ in the diagrams are similar.
 $AB = 8$ cm, $CD = 6$ cm, $SP = 3.7$ cm and $PQ = 4$ cm.
 Angle $DAB = 118^\circ$.

Find

(i) angle SPQ ,

Answer (a) (i) [1]

(ii) the length SR ,

Answer (a) (ii) cm [1]

(iii) the length DA .

Answer (a) (iii) cm [1]

(b) Complete the statement “Corresponding pairs of sides of any two similar figures are

.....” [1]

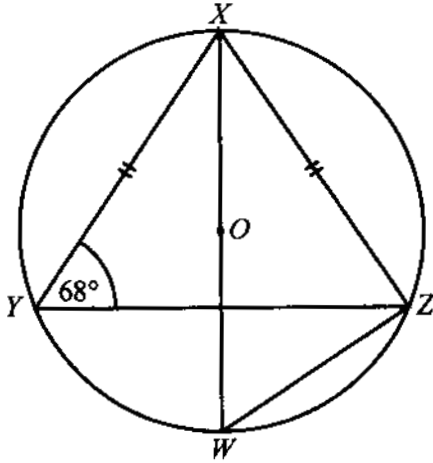
(c) Draw sketches of two rectangles which are not similar.

[2]

Question 8

(a)

NOT TO SCALE



WX is a diameter of a circle centre O ,
 YZ is a chord and $XY = XZ$. Angle $XYZ = 68^\circ$.
 Find

(i) angle XZW ,

Answer (a)(i) Angle $XZW = \dots\dots\dots$ [1]

(ii) angle WZY ,

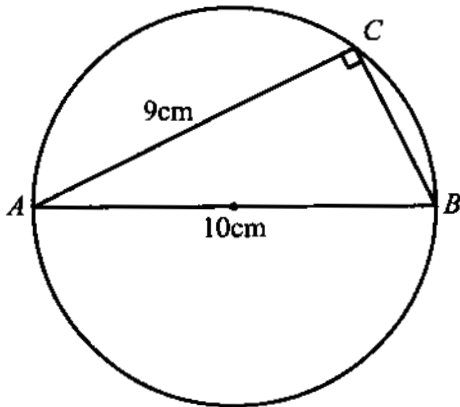
Answer (a)(ii) Angle $WZY = \dots\dots\dots$ [2]

(iii) angle YXZ .

Answer (a)(iii) Angle $YXZ = \dots\dots\dots$ [2]

(b)

NOT TO SCALE



AB is a diameter of a circle and is 10 cm long.
 Chord $AC = 9$ cm.
 Calculate

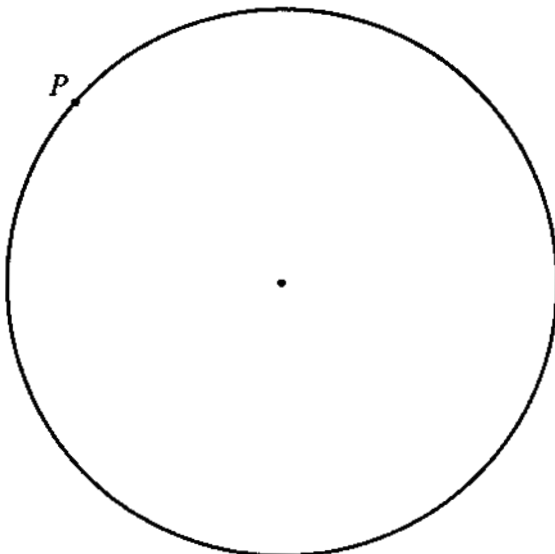
(i) the length of BC ,

Answer (b)(i) $BC = \dots\dots\dots$ cm [2]

(ii) angle ABC .

Answer (b)(ii) Angle $ABC = \dots\dots\dots$ [2]

(c)



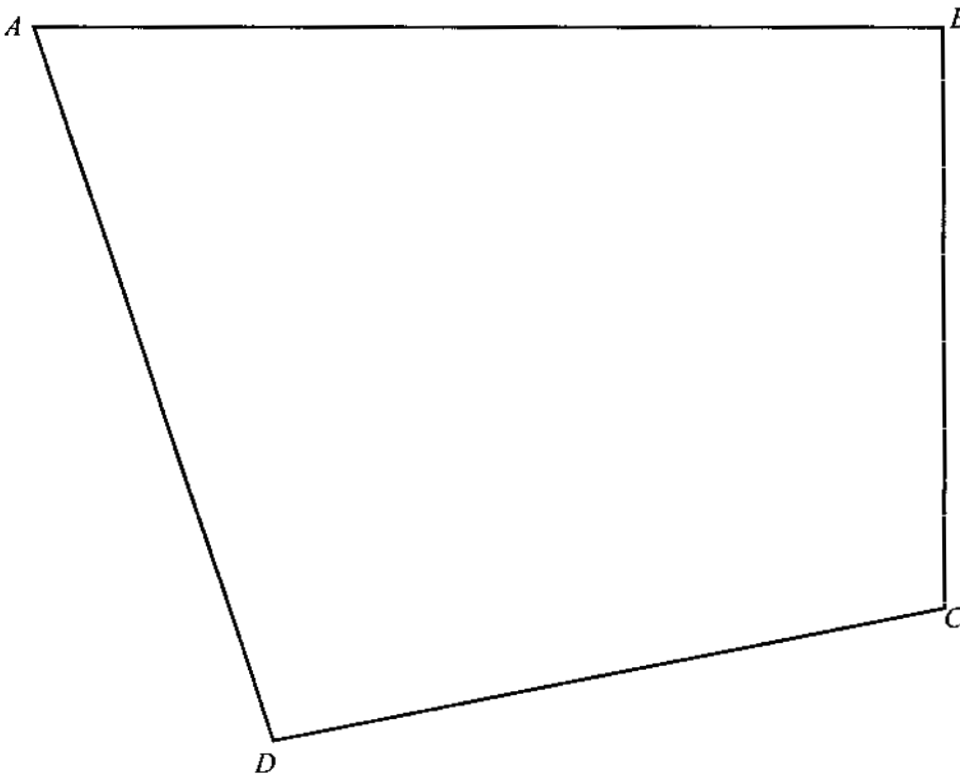
P , Q and R are three points on the circumference of a circle. Angle $PQR = 90^\circ$ and angle $RPQ = 40^\circ$.

(i) Construct triangle PQR .
 (The point P has been marked for you.) [2]

(ii) Measure and write down the length of PQ .

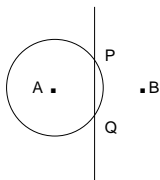
Answer (c)(ii) $PQ = \dots\dots\dots$ cm [1]

Question 9



- (a) Draw accurately the locus of points **inside** the quadrilateral above which are
- (i) 10 cm from the point *A*, [2]
 - (ii) 6 cm from the line *AB*. [2]
- (b) Using straight edge and compasses only, construct the locus of points **inside** the quadrilateral *ABCD*, which are equidistant from the lines *AB* and *BC*. [2]
- (c) This diagram is the scale drawing of a park and 1 cm represents 20 m. The park has fences along *AB*, *BC*, *CD* and *DA*. There are gates at *A*, *B*, *C* and *D*.
- (i) There is a play area which is less than 200 m from gate *A* and nearer to fence *AB* than to fence *BC*.
On the diagram shade this area clearly and label it *P*. [2]
 - (ii) There is a quiet area which is more than 200 m from gate *A* and more than 120 m from fence *AB*.
On the diagram shade this area clearly and label it *Q*. [2]
 - (iii) A statue, *S*, is 200 m from gate *A* and 120 m from fence *AB*.
 - (a) Mark *S* on the diagram. [1]
 - (b) How far is the statue from gate *C*?

Answer (c) (iii) (b) m [2]

QUESTION	ANSWER	MARK	
1	4440	2	(M1) for 1 cm \equiv 400 km or figures 444 seen
2 (a)	1 0	1 1	
(b)	2	1	
3 (a)(i)	Circle, centre A, radius 3cm	1	Allow radius to be between 2.9cm and 3.1cm
(a)(ii)	Perpendicular bisector of AB in drawn	1	
(b)		1	P and Q clearly marked at intersections
4 (a)	32	1	Correct answer only
(b)	90	1	Correct answer only
(c)	122	1	Correct answer only
5 (a)(i)	012	1	Accept answers in the range 011° to 013°
(a)(ii)	133	1	Accept answers in the range 132° to 134°
(b)(i)	50	1	Correct answer only
(b)(ii)	210	1	Accept answers in the range 205km to 215km \surd award (B1) for $4.2 (\pm 0.1) \times (b)(i)$
6 (a)	35	1	Correct answer only
(b)	145	1	Correct answer only
(c)	250	2	(M1) for $(180 - 40) \div 2$ or 70 seen or implied
7 (a)(i)	118	1	Correct answer only
(a)(ii)	3	1	Correct answer only
(a)(iii)	7.4	1	Correct answer only
(b)	"in proportion"	1	Allow "to scale" or "in the same ratio"
(c)	Two rectangles drawn and labelled with dimensions not in proportion, or clearly not similar.	2	(SC1) for two rectangles only just dissimilar
8 (a)(i)	90	1	Correct answer only
(a)(ii)	22	2	(M1) for $90 - 68$ seen

QUESTION	ANSWER	MARK	
(a)(iii)	44	2	(M1) for $180 - (2 \times 68)$ or $2 \times (90 - 68)$ √ award (SC1) for $2 \times a(ii)$
(b)(i)	4.36	2	Accept 4.358898944 rounded to $\geq 3s.f.$ (M1) for $\sqrt{10^2 - 9^2}$ or $\sqrt{19}$
(b)(ii)	64.2	2	Accept 64.15806724 rounded to $\geq 3s.f.$ M1 for $\sin^{-1}(9 \div 10)$ or equiv
(c)(i)	Diameter PR drawn Triangle PQR drawn	1 1	
(c)(ii)	5.5 to 5.7	1	√ award (SC1) for correct measurement of 'his' PQ
9 (a)(i)	An arc, centre A, radius 10cm ($\pm 2mm$)	2	(SC1) if inaccurate but $< 10mm$ out or a short arc
(a)(ii)	A line, parallel to AB, 6cm away ($\pm 2mm$)	2	(SC1) if inaccurate but $< 10mm$ out or a short line
(b)	Accurate bisector of angle B ($\pm 1^\circ$), with arcs seen	2	(SC1) for accurate bisector with no arcs seen or inaccurate with arcs $< 3^\circ$ out or accurate bisector of another angle (with arcs)
(c)(i)	Area P shaded clearly	2	√ dependent on at least 1 mark in (a)(i) and bisector of angle B drawn
(c)(ii)	Area Q shaded clearly	2	√ dependent on at least 1 mark in (a)(i) and 1 mark in (a)(ii)
(c)(iii)	(a) S labelled	1	√ S marked at intersection of the two loci in (a)
	(b) An answer consistent with the diagram	2	S must be marked and labelled inside ABCD Allow CS $\pm 4m$ (M1) for "anything" x 20 seen

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.