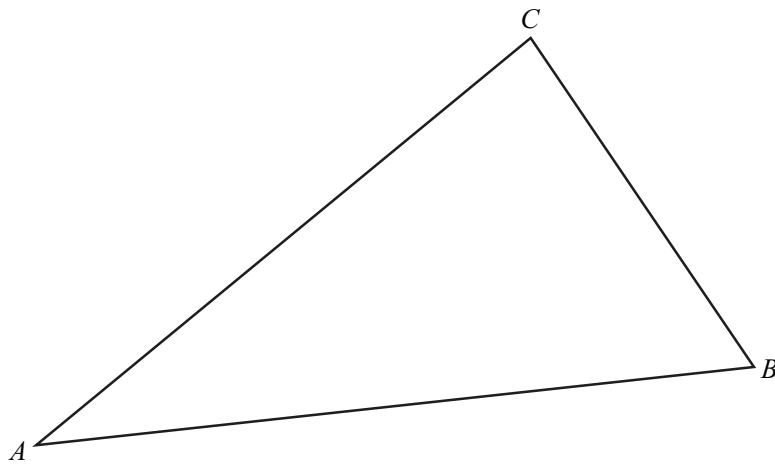## Scale drawing / loci / symmetry 1

1)
The scale on a map is 1 : 20 000.

Calculate the actual distance between two points which are 2.7 cm apart on the map.
Give your answer in kilometres.

Answer .... km [2]

2)

(a) On the diagram above, **using a straight edge and compasses only**, construct

  (i) the bisector of angle *ABC*,   [2]

  (ii) the locus of points which are equidistant from *A* and from *B*.   [2]

(b) Shade the region inside the triangle which is nearer to *A* than to *B* **and** nearer to *AB* than to *BC*.
                                                                                          [1]

3)

(a) In the space below, construct the triangle ABC with $AB = 10$ cm and $AC = 12$ cm.
Leave in your construction arcs.
The line BC is already drawn.

B ———————————————————————————— C

[2]

3cont)

(b) Measure angle *ABC*.

Answer(b) Angle *ABC* = ... [1]

(c) (i) Using a straight edge and compasses only, and leaving in your construction arcs, construct the perpendicular bisector of *BC*. [2]

(ii) This bisector cuts *AC* at *P*.

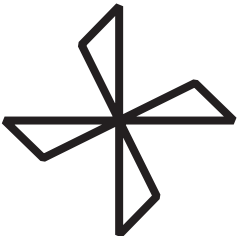Mark the position of *P* on the diagram and measure *AP*.

Answer(c)(ii) *AP* = ... cm [1]

(d) Construct the locus of all the points inside the triangle which are 5 cm from *A*. [1]

(e) Shade the region inside the triangle which is

- nearer to *B* than to *C*

and

- less than 5 cm from *A*. [2]

4) Complete the information about each shape.

Shape		
Number of lines of symmetry	....	....
Order of rotational symmetry	....	....

[4]

5)

P ─────────────────────────────────── Q

(a) In the space above, construct triangle *PQR* with *QR* = 9 cm and *PR* = 7 cm.
Leave in your construction arcs.
The line *PQ* is already drawn. [2]

(b) Using a straight edge and compasses only, construct

  (i) the perpendicular bisector of *PR*, [2]

  (ii) the bisector of angle *QPR*. [2]

(c) Shade the region inside the triangle *PQR* which is

  nearer to *P* than to *R*   **and**   nearer to *PQ* than to *PR*. [1]

(d) Triangle *PQR* is a scale drawing with a scale 1 : 50 000.

Find the **actual** distance *QR*.
Give your answer in kilometres.

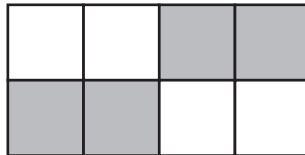*Answer(d)* .... km [2]

6) A running track has a boundary that is always 40 metres from a straight line, *AB*.
AB = 70 m.
The scale drawing below shows the line *AB*.
1 centimetre represents 10 metres.

A   70 m   *B*
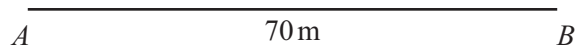
(a) Complete the scale drawing accurately to show the boundary of the running track.   [2]

7)

For the diagram, write down

(a) the number of lines of symmetry,

Answer(a) .... [1]

(b) the order of rotational symmetry.

Answer(b) .... [1]

8)

$A \cdot$ $\cdot B$
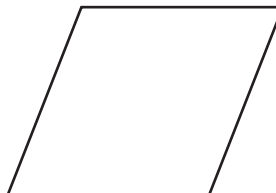
Using a straight edge and compasses only, construct the locus of points which are equidistant from point *A* and from point *B*.

Show clearly all your construction arcs.   [2]
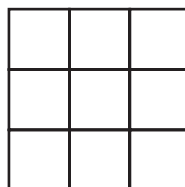
9)

(a)

The diagram shows a rhombus.

Draw all the lines of symmetry.   [2]
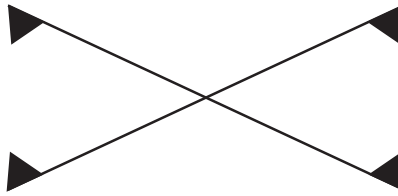
(b)

Shade **two** squares in the diagram above so that the figure has **one** line of symmetry and **no** rotational symmetry.   [1]

Scale drawing / loci / symmetry 1
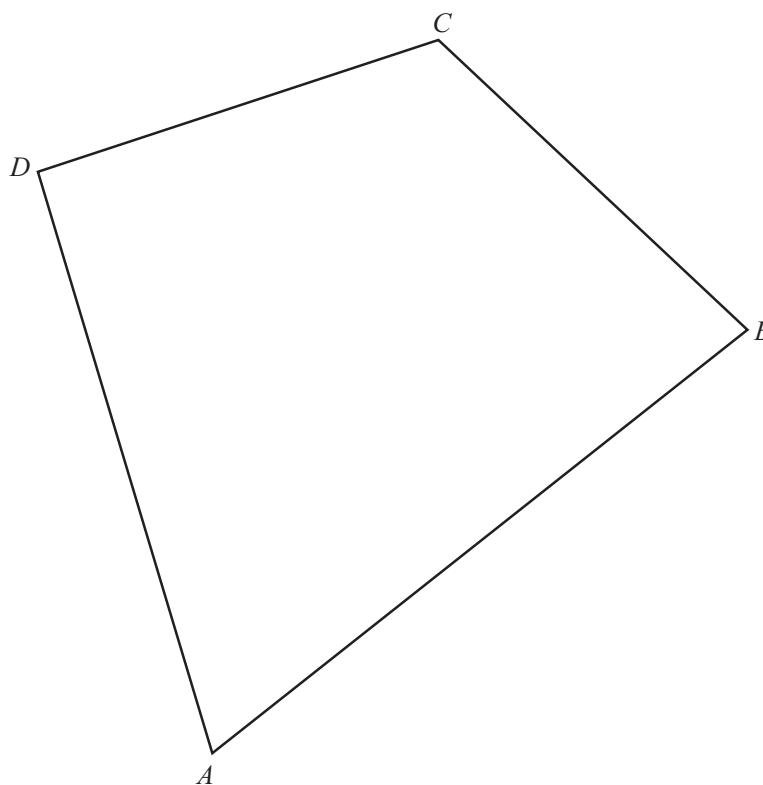
10)

For the diagram, write down

(a) the number of lines of symmetry,

Answer(a) .... [1]

(b) the order of rotational symmetry.

Answer(b) .... [1]

11)

The diagram shows a quadrilateral *ABCD*.

(a) **Using a straight edge and compasses only**, construct

(i) the perpendicular bisector of *AB*, [2]

(ii) the bisector of angle *ADC*. [2]

(b) Draw accurately the locus of points, inside the quadrilateral, that are 2 cm from *BC*. [2]

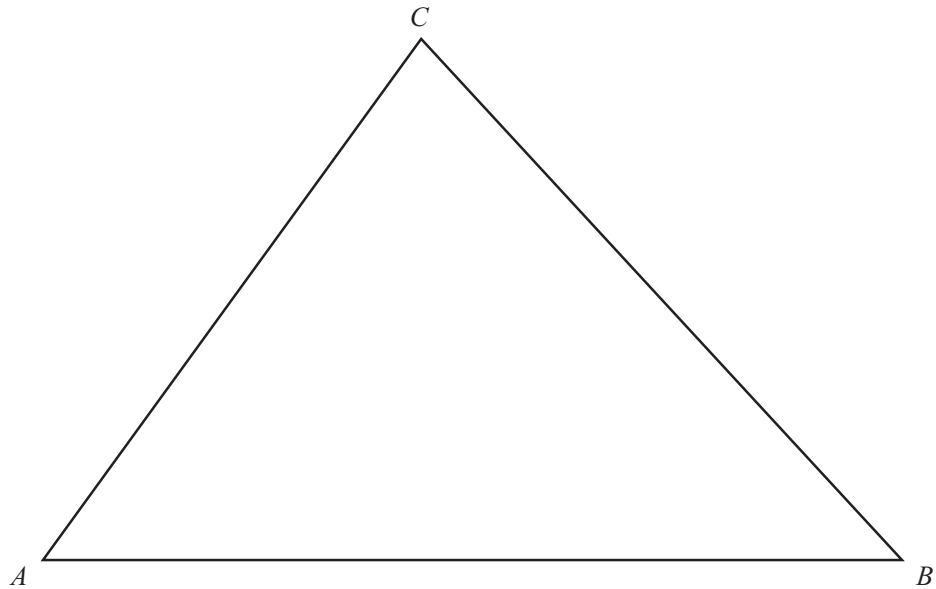**(c)** Shade the region, inside the quadrilateral, which is

nearer to *B* than to *A*

and nearer to *DC* than to *DA*

and more than 2 cm from *BC*. [1]

12)

Triangle *ABC* is drawn accurately.

(a) Measure and write down

    (i) the length of *AC*,

Answer(a)(i) *AC* = ... cm   [1]

    (ii) the size of angle *CAB*.

Answer(a)(ii) Angle *CAB* = ...   [1]

(b) Construct accurately the locus of all the points 7 cm from *C*.   [2]

(c) The point *X* lies **outside** the triangle *ABC*, with *CX* = 7 cm and angle *BCX*= 67°.
Draw accurately the line *CX*.   [2]

(d) Draw the line *BX*. Measure and write down the length of this line.

Answer(d) BX = ... cm   [1]

(e) **Using a straight edge and compasses only**, construct the locus of points equidistant
from *BC* and from *BX*.   [2]

13)

In triangle *ABC*, *BC* = 9 cm and *AC* = 11 cm.
The side *AB* has been drawn for you.

A ———————————————————————————— *B*

(a) Using ruler and compasses only, complete the triangle *ABC*. [2]

(b) Measure and write down the size of angle *CAB*.

Answer(b) Angle *CAB* = ... [1]

(c) **For the constructions below, use a straight edge and compasses only.**
Leave in all your construction arcs.

(i) Construct the bisector of angle *ABC*.
Label the point *P* where the bisector crosses *AC*. [2]

(ii) Construct the locus of points which are equidistant from *A* and from *C*.
Label the point *Q* where the locus crosses *AC*. [2]

(d) (i) Write down the length of *PQ* in centimetres.

Answer(d)(i) .... cm [1]

(ii) Shade the region inside the triangle which is nearer to *AB* than to *BC*
and nearer to *C* than to *A*. [1]

(e) Triangle *ABC* is a scale drawing.
The 9 cm line, *BC*, represents a wall 45 metres long.
The scale of the drawing is 1 : *n*.
Find the value of *n*.

Answer(e) n = ... [2]

14)   **(a)**

A _____ B

The line AB is drawn above.

Parts (i), (iii), and (v) must be completed using a ruler and compasses only.
All construction arcs must be clearly shown.

(i) Construct triangle ABC with $AC = 7\,$cm and $BC = 6\,$cm.   [2]

(ii) Measure angle BAC.

Answer(a)(ii) Angle $BAC =$ .... [1]

(iii) Construct the bisector of angle ABC.   [2]

(iv) The bisector of angle ABC meets AC at T.

Measure the length of AT.

Answer(a)(iv) $AT =$ .... cm [1]

(v) Construct the perpendicular bisector of the line BC.   [2]

(vi) Shade the region that is

- nearer to B than to C

and

- nearer to BC than to AB.   [1]