

## Loci questions

### Remember the 4 loci:

- Equidistant from 1 point – CIRCLE
- Equidistant from 2 points – PERPENDICULAR BISECTOR
- Equidistant from 1 line – SAUSAGE
- Equidistant from 1 point – ANGLE BISECTOR

1. Draw a point and label it A. Draw the locus of points less than or equal to 3 cm from A.
2. Draw two points 5 cm apart and label them A and B. Construct the locus of points equidistant from A and B.
3. Draw a line, PQ, 3 cm long. Draw the locus of points less than or equal to 2 cm from PQ.
4. Draw two intersecting lines AB and AC so that they intersect at A. Construct the locus of points equidistant from AB and AC.
5. Two towns, Hilldon and Baton, are 20 miles apart. It is proposed to build a new shopping centre that satisfies these conditions:
  - Within 15 miles of Hilldon
  - Nearer to Baton than Hilldon.
 Using a scale of 1 square = 5 miles, make a scale drawing and show the region where the shopping centre can be built.
6. Kirsty has a triangular patio with sides of 6m, 4m and 5m. She wants to put a plant pot on the patio more than 2m from any corner. Using a scale of 1 square = 1 m, construct a drawing and show, by shading, where she can put the plant pot.
 

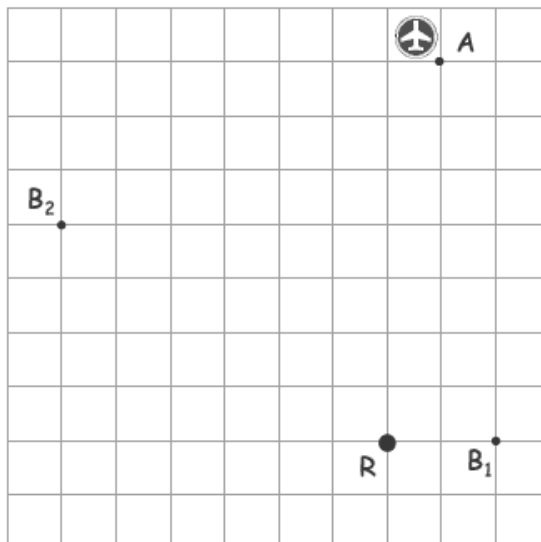
**N.B.** Don't worry too much if the dimensions of your triangle are not precise.

### For questions 7-10 use the following scales

7. 1 square = 20 miles
8. 1 square = 3 metres (Look at E.g. 1 from Loci example for help)
9. 1 square = 15 metres (Look at E.g. 4 from Loci example for help)
10. 1 square = 200 metres

7.

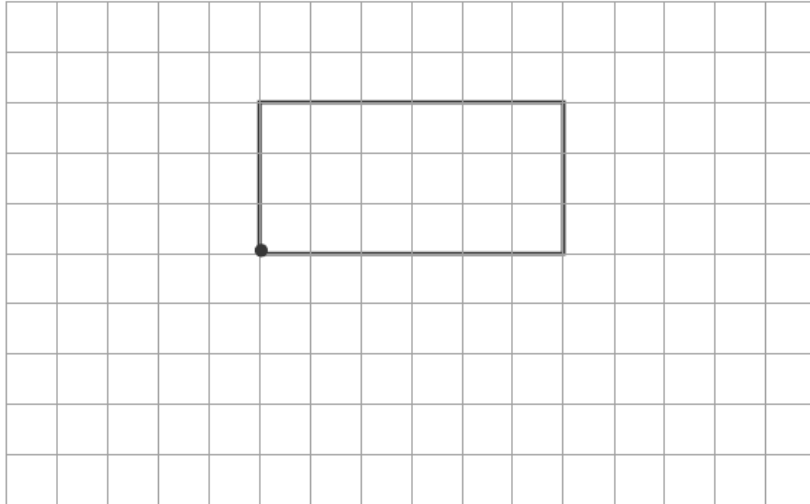
A military aircraft takes off on a navigation exercise from airfield A. As part of the exercise it has to fly exactly between the 2 two beacons indicated. There is a radar station at R with a range of coverage of 40 miles in all directions.



- (a) Determine the flight path along which the aircraft must fly.
- (b) Will the radar station be able to detect the aircraft during the flight?

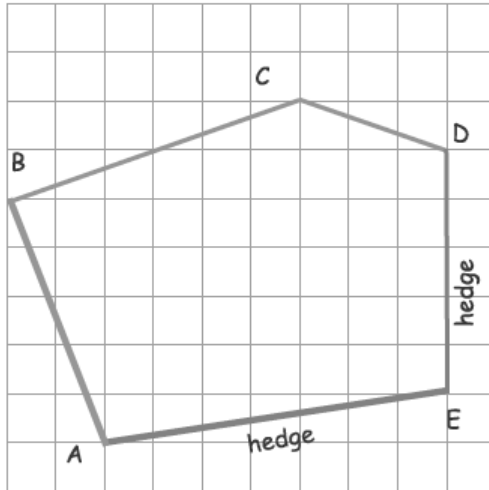
8.

Buster the dog is tethered by a 12m long rope at the corner of the shed as shown in the diagram. Draw and shade the area in which Buster can move.



9.

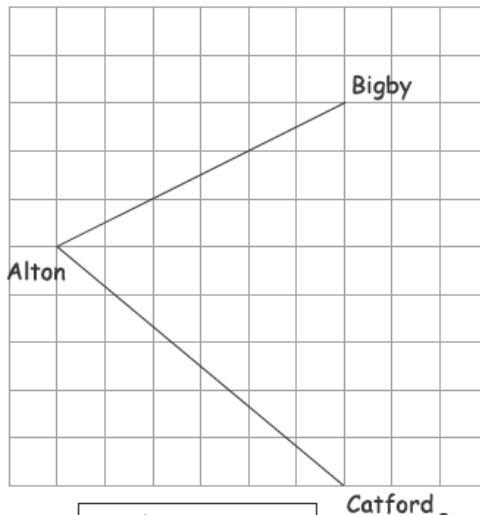
Another farmer wants to lay a water pipe across his field so that it is equidistant from two boundary hedges. He also wants to connect a sprinkler in the exact centre of the pipe, that waters the field for 45 metres in all directions.



- (a) Show the position of the pipe inside the field.
- (b) Mark the point of connection for the sprinkler.
- (c) Show the area of the field that is watered by the sprinkler.

10.

Three towns are connected by 2 roads as shown. Three wind turbines are to be positioned to supply electricity to the towns. The row of three turbines are to be placed so that they are equidistant from both roads. The centre turbine is to be equidistant from Alton and Bigby. The turbines are to be 400 m apart.



- (a) Show the line on which the turbines must sit.
- (b) Find the position of the centre turbine.
- (c) Show the position of the other two.