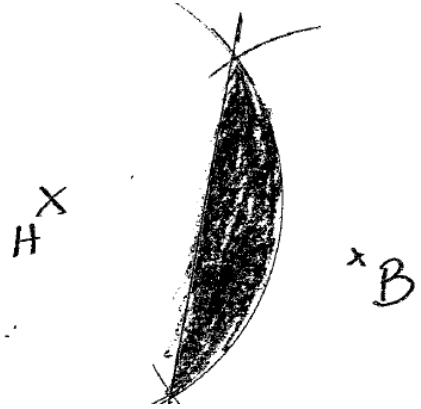


Loci Questions SOLUTIONS

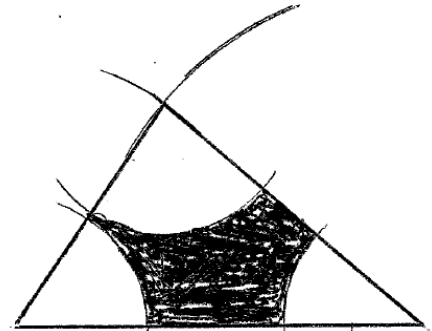
1. Draw a circle of radius 3 cm with point A as the centre. The circumference should be a solid line and inside the circle should be shaded.
2. Construct the perpendicular bisector – make sure you leave your construction arcs on the diagram.
3. Draw a “sausage” 2 cm from the line AB. The sausage should be a dotted line and we shade inside it.
4. Construct the angle bisector – make sure you leave your construction arcs on the diagram.
5. “Within 15 miles of Hildon” – draw a circle of radius 4 squares (20 miles) around H.
Nearer to Baton than Hildon – draw the perpendicular bisector

The shaded region must satisfy both conditions so we shade inside the circle but closer to Baton



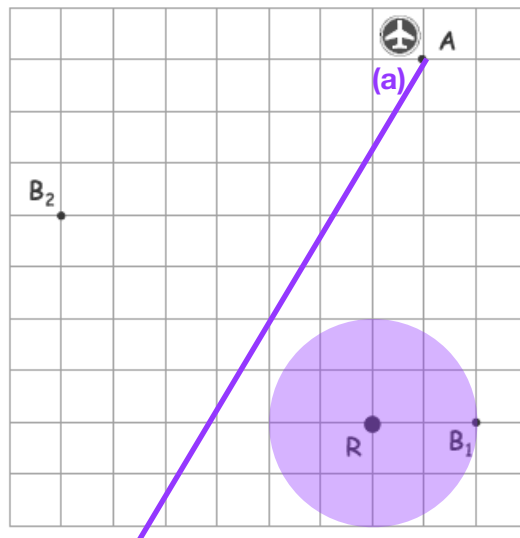
6. Draw arcs using each vertex of the triangle as the centre. The arcs have radius 2 squares.

The plant pots have to be further than 2 cm away so shade inside the triangle but outside the arcs.



7. **1 square = 20 miles**

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?

(b) The shaded purple circle shows the range of the radar. So the radar station will *not* be able to detect the aircraft during the flight

N.B. The flight path of the aircraft is not the perpendicular bisector of B₁ and B₂. It passes through the mid-point of B₁ and B₂. You can find the mid-point by counting the number of squares across and down.

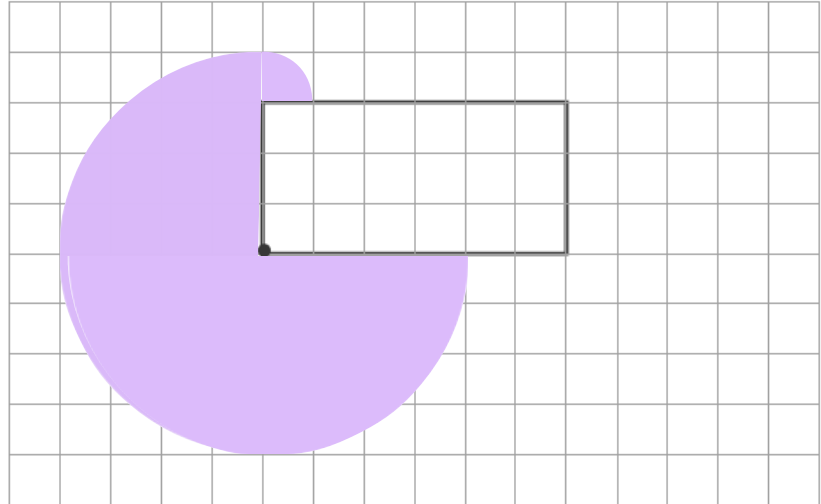
8. **1 square = 3 metres**

12 m = 4 squares so we need a circle of radius 4 squares going round the shed.

As the rope gets round to the top part of the shed there are 3 m left i.e. 1 square.

So the little quarter-circle at the top is of radius 1 square.

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. **1 square = 15 metres**

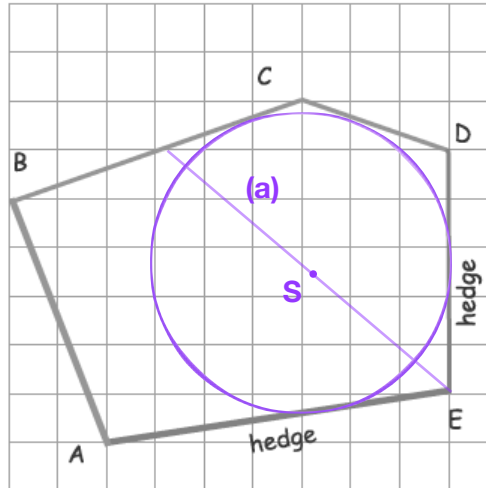
(a) We need the line that is equidistant from EA and ED (i.e. the 2 hedges).

This means we need to construct the angle bisector of the lines.

(b) We need the centre of the line so construct the perpendicular bisector. The centre is marked S.

(c) Draw a circle of radius 3 sq. and shade inside.

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.

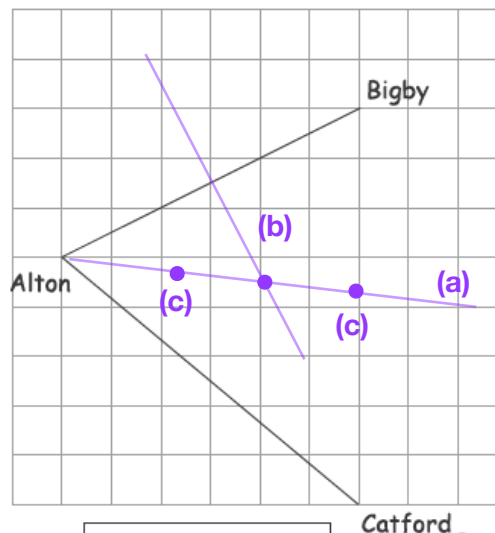
10. **1 square = 200 m**

(a) We need the line that is equidistant from the two roads so construct the angle bisector.

(b) The centre turbine is equidistant from Alton and Bigby so construct the perpendicular bisector. The centre turbo is where the angle and perpendicular bisectors intersect.

(c) Measure the other turbines 2 squares away from the centre turbine

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.