

Loci

What you should know

How to construct lines parallel and perpendicular to a given line.

New idea

You can find the locus of points equidistant from a fixed point and a fixed straight line.

Task: More complicated loci

What is the locus of all the points that lie equidistant from a fixed point and a fixed line?

The diagram shows two points (B and C) that lie on the locus.

Can you find all the points on the locus?

This worksheet shows you ways to explore this.

Pencil and paper

- Start by drawing some lines parallel to the fixed line.
- Measure the distance from one of the parallel line to the fixed line. (1.1 cm in the example).
- Draw a circle with centre the fixed point and that radius.
- You should usually get two points on the locus. Why?
- Repeat this with other parallel lines then sketch a curve through the points.

Geometry software

- Can you display the locus using geometry software?

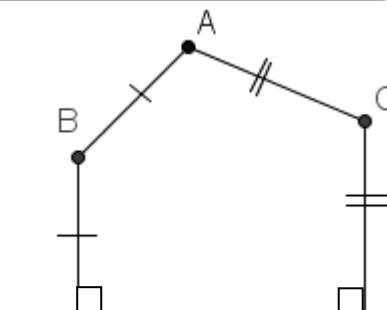
Algebra

Use the x -axis as the fixed line and choose a point on the y -axis as the fixed point.

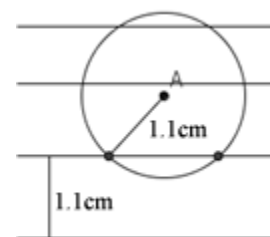
- For a point with coordinates (x, y) , what is its distance from the fixed line?
- What is its distance from the fixed point?
- Can you find an equation connecting the coordinates x and y ?

Take it further

The shape of the locus is called a parabola. Find out more about parabolas.



A is the fixed point.
B and C are both equidistant between the fixed point and the line.

**Where this goes next**

At A level the parabola is studied in Core Mathematics and Further Mathematics.