

Why use this resource?

The problem in this resource will reinforce the link between the equation of a circle and its graphical representation. The simple image presented is surprisingly rich when considered in detail. Students can take an algebraic approach but may find that a geometric approach can make the problem much simpler.

Preparation

Students will need to know how to find the equation of a straight line and a circle.

The task can be attempted on paper but it would be helpful for students to have access to [Desmos](#) or similar graphing software.

Possible approach

Students might start by trying to recreate the original image:

- Using [Desmos](#) they will very quickly start to think in terms of coordinate geometry
- Using pencil, ruler and compasses on paper they will be more likely to notice other features of the diagram such as symmetry and key points on the circles
- Using either method students will need to think about a concrete example and this can help them to get their heads around the problem

Students can then be guided to think about the six specific cases listed in the problem. Allowing students some choice about the order in which they think about these cases can encourage multiple approaches from the class as a whole which can then be shared and discussed.

Key questions

- Which circle should we draw first? Does it matter?
- What symmetry properties does the image have?
- What can we label in the diagram?

Possible support

Encouraging students to use [Desmos](#) can help them to grapple with the equation of a circle (without direct input from the teacher).

Possible extension

Students could think about the “Another triangle” part of the problem page. They might also be invited to create their own images.