## Short activity

The Ancient Greeks were skilled mathematicians who devised interesting number and algebra problems which were to be solved using only a pencil, a straight edge and a pair of compasses.

Numerical values were represented by straight lines of a given length.

For example, if a length such as this is then a line twice its length
$\qquad$
$\qquad$
said to be of length ' 1 ', would have a value of ' 2 '.

Random lengths are used to represent unknown values e.g.
a
b
$\qquad$

In the following diagram, a semi-circle is shown with centre o.
Lengths of $a, x$ and 1 are marked, with the diameter being $a+1$ and $x$ being the perpendicular height of the semi-circle a distance of 1 unit from the circumference.

What is the unknown value ' $x$ ' in terms of $a$ ?


## Euclidian Algebra and Calculation 2

## Teacher notes

Content:

- Similar triangles
- Circle theorems
- Algebraic manipulation

Possible uses:

- As an extension task for more able pupils
- As a challenge task for individuals or pairs of pupils

Resource options:

- PowerPoint file for whole class projection
- Worksheet for individual pupils
- Geogebra file


## Answers

If pupils need a hint, mark angle $\theta$ on the diagram and ask what other angles they are then able to label.


This is an ancient Greek method for finding the square root of a given value: $a=x^{2}$ or $x=\sqrt{a}$

Using Dynamic Geometry Software to demonstrate this once pupils have shown that it is true can be helpful. This is one of those constructions that seems difficult to believe, even after proving it!

