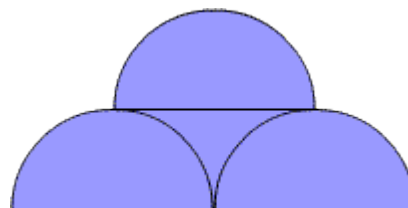
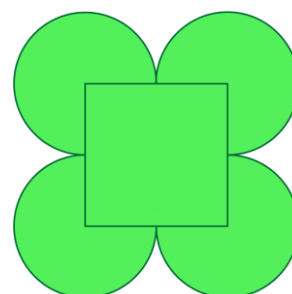


**Stage 4 ★**
Mixed Selection 3**1. Semicircle stack**

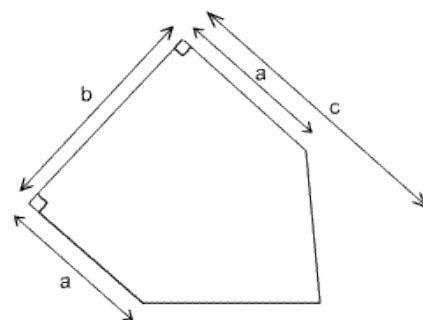
The diagram shows three semicircles, each of radius one. What is the size of the total area shaded?

**2. Four leaf clover**

The diagram shows four equal discs and a square. Each disc touches its two neighbouring discs. Each corner of the square is positioned at the centre of a disc. The side length of the square is $2/\pi$. What is the length of the perimeter of the figure?

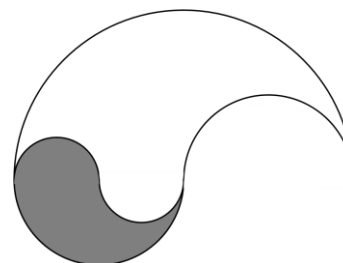
**3. Pentagonal area**

What is the area of the pentagon shown?

**4. Semicircular design**

The diagram to the right shows a logo made from semi-circular arcs, each with a radius of 2cm, 4cm or 8cm.

What fraction of the logo is shaded?



These problems are adapted from UKMT Mathematical Challenge problems (ukmt.org.uk)