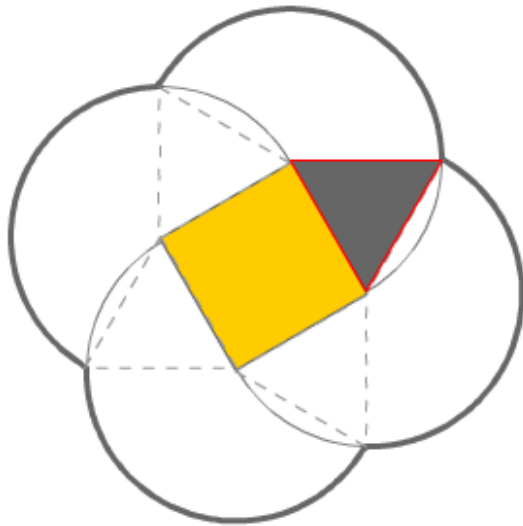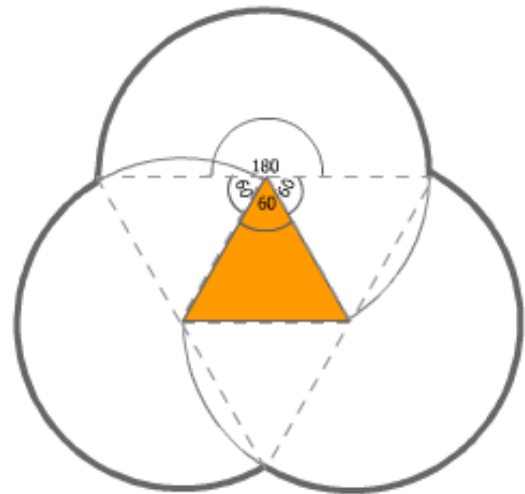We can produce a flower with three petals by rotating one equilateral triangle around another:

If each equilateral triangle has side length r, can you work out the perimeter of the flower's petals?

It may help to work in terms of π throughout this problem.

Now consider a flower made by the triangle rotating about a square with side length r - what is the perimeter of the petals now?

What is the perimeter when the centre of the flower is a regular pentagon, hexagon, heptagon...?

What can you say about the increase in perimeter as the number of sides of the centre shape increases?

Can you explain this increase?

What would be the perimeter of a flower whose centre is a regular 100-sided polygon with side length r?