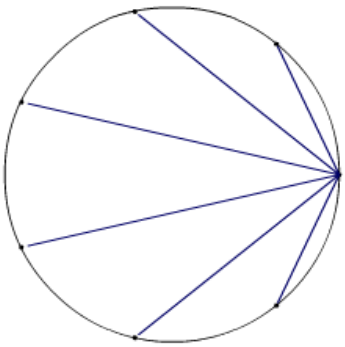
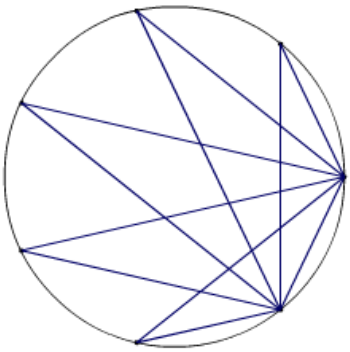
Mystic Rose

The circle below has seven points spread equally around its circumference.

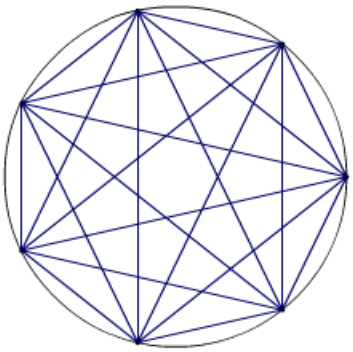
The images show the mystic rose at three different stages of its construction:



Stage 1



Stage 2



Complete

Can you describe how to construct a mystic rose?

Can you describe what a completed mystic rose looks like?

Alison and Charlie have been wondering how many lines are needed to draw a 10 pointed mystic rose.

Alison wrote down the calculation 9+8+7+6+5+4+3+2+1.

Charlie wrote down the calculation (10 × 9) ÷ 2.

Who is right? Can you explain how the calculations relate to the diagram?

Investigate the number of lines needed in mystic roses of different sizes.
How would Alison work them out? How would Charlie do it?
Will they always get the same result?

What are the advantages of the alternative methods?

How many lines are needed for a 100 pointed mystic rose?

Which of the numbers below could be the number of lines needed to draw a very large mystic rose?
How many points would each mystic rose have around its circumference?

4851 6214 3655 7626 8656