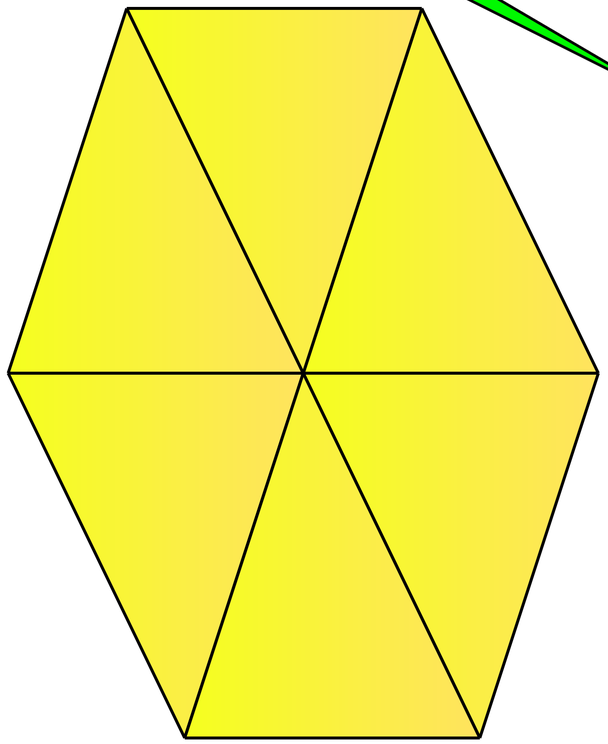
# Angles and Triangles

**Learning Objective:**

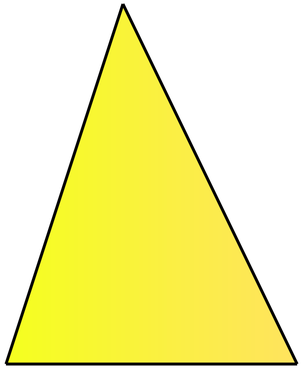
To identify angles around a point which total 360°.

Did you know that you can make interesting patterns using triangles because of their special properties?

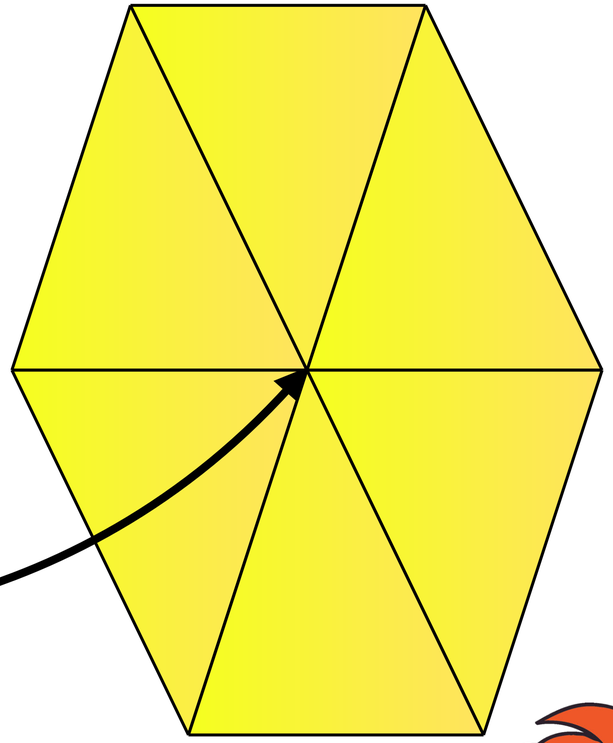


Because the angles inside a triangle total 180°, six of the same triangle will fit exactly around a point.

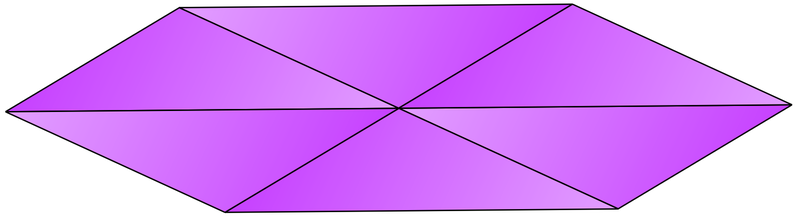
This pattern was made using one triangle:



Exact copies of the triangle can fit without gaps around one point in the middle of the pattern:



You can always fit six of the same triangle around a point:

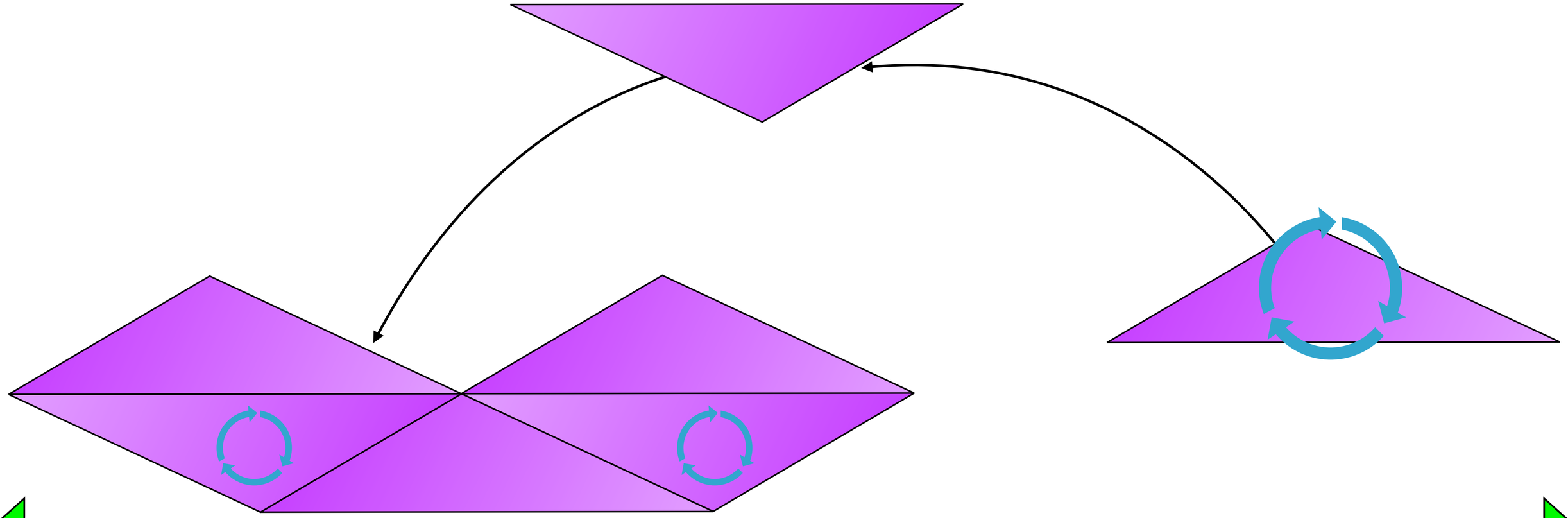


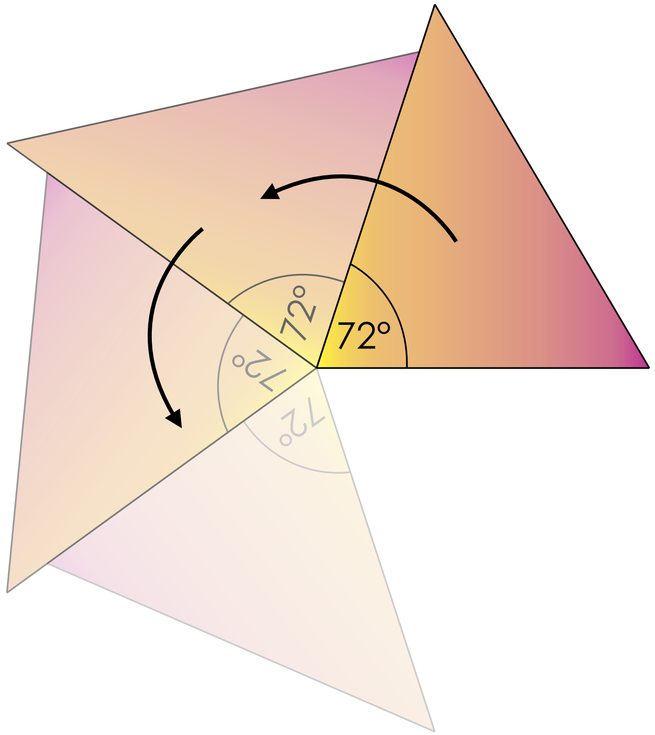
What do you have to do to the triangles to make them fit like this?

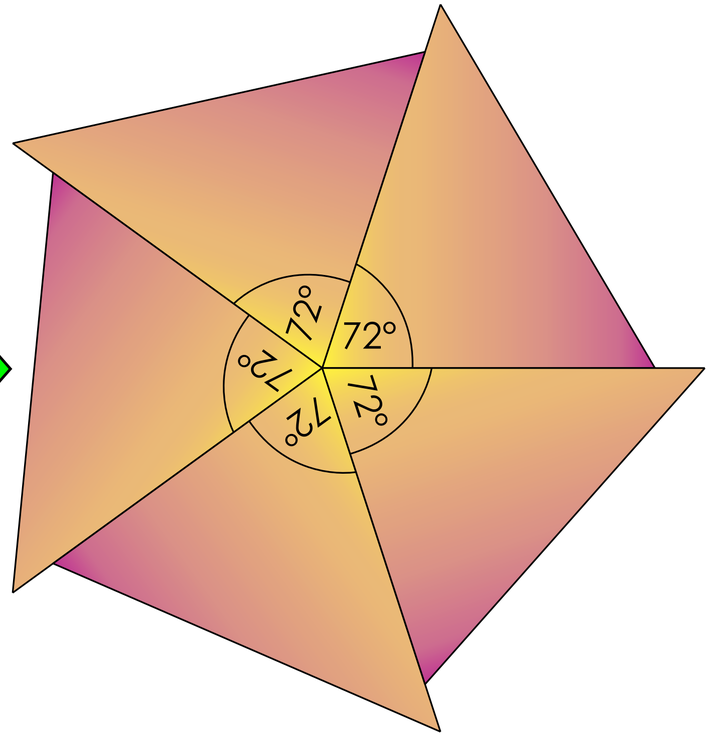
**Discuss your ideas...**

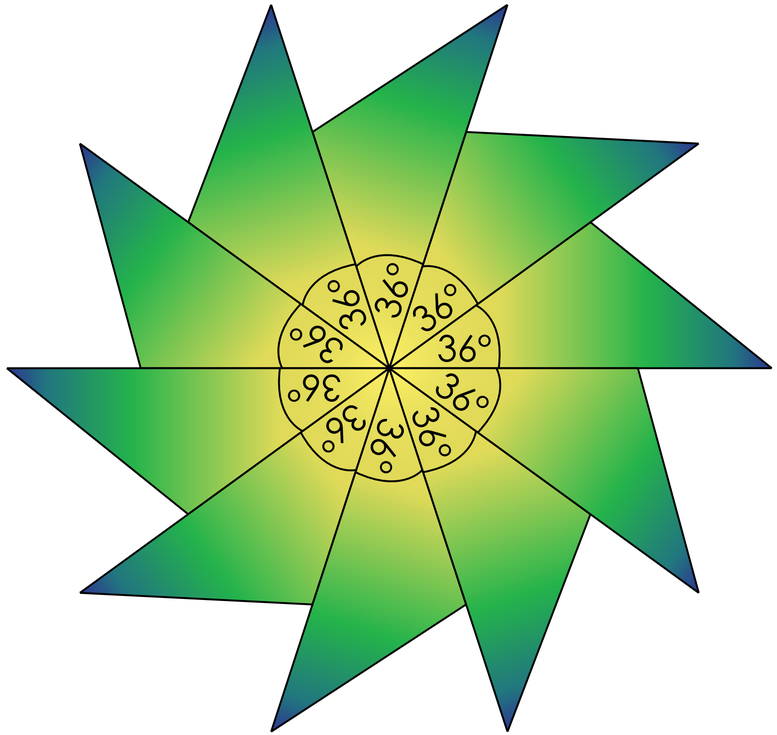
# Did you think of this?

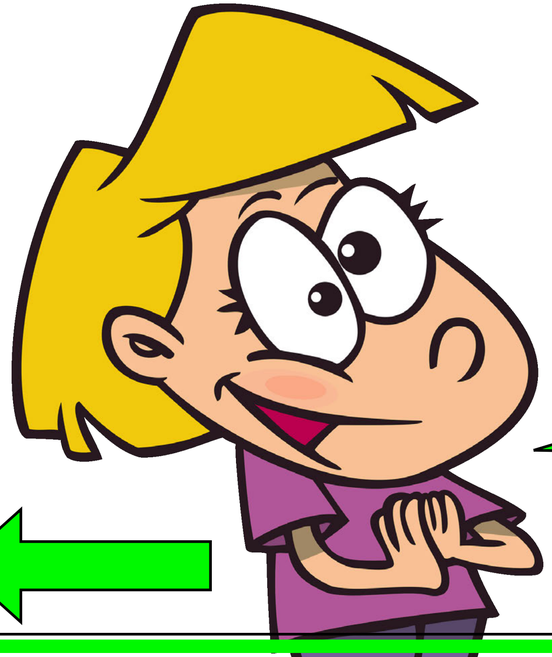
Every other triangle is rotated half a turn, or 180°. You can do this with any triangle and it will make a pattern without gaps around a point.



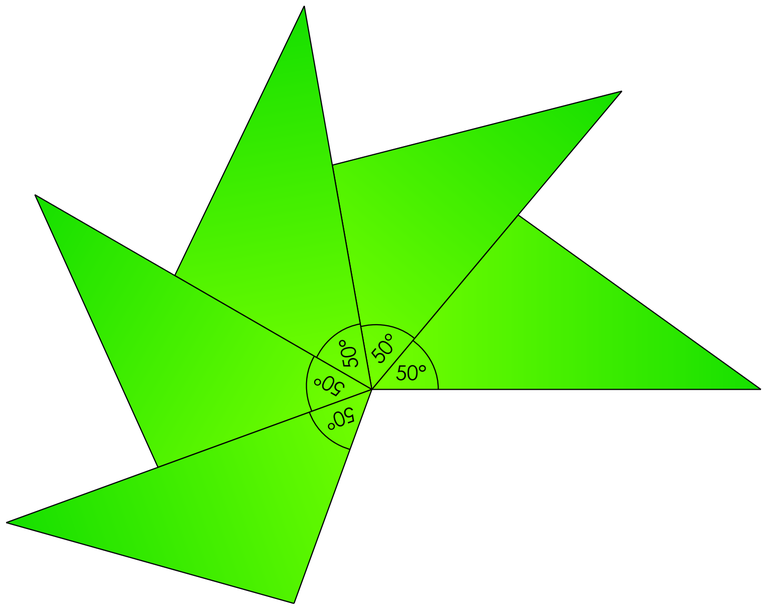


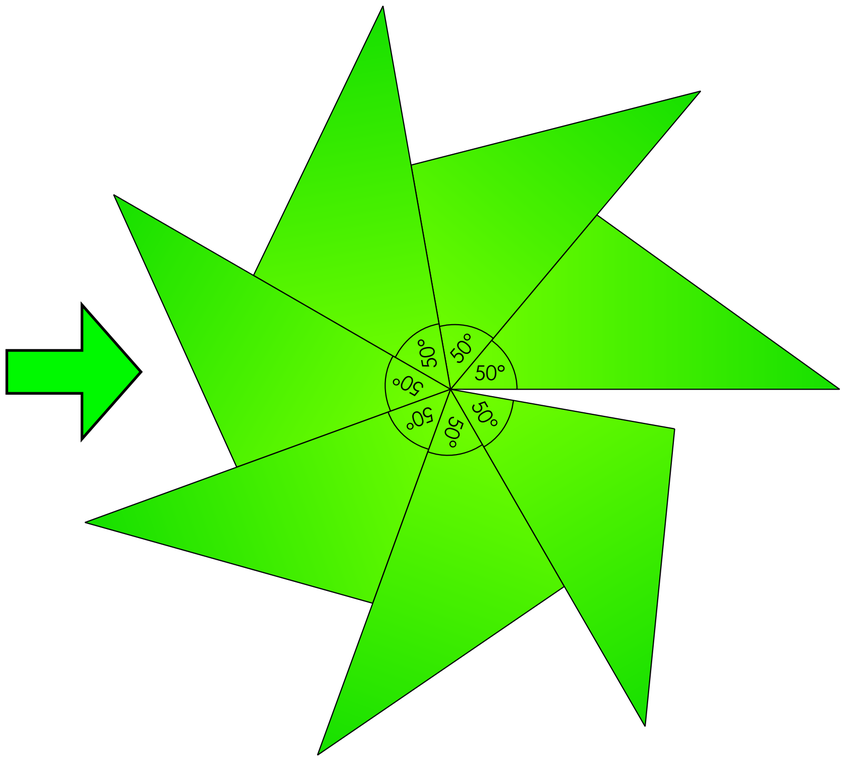



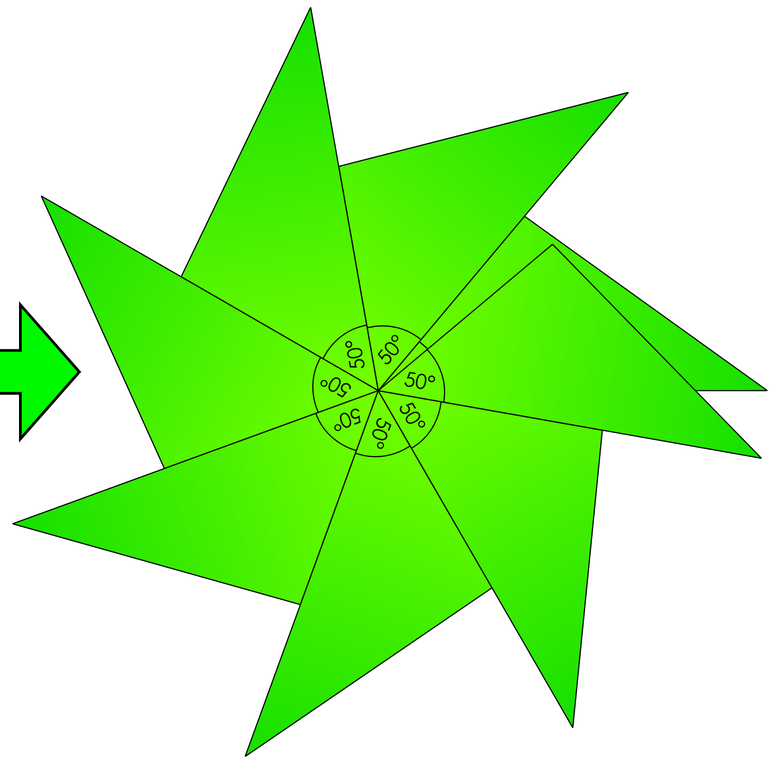



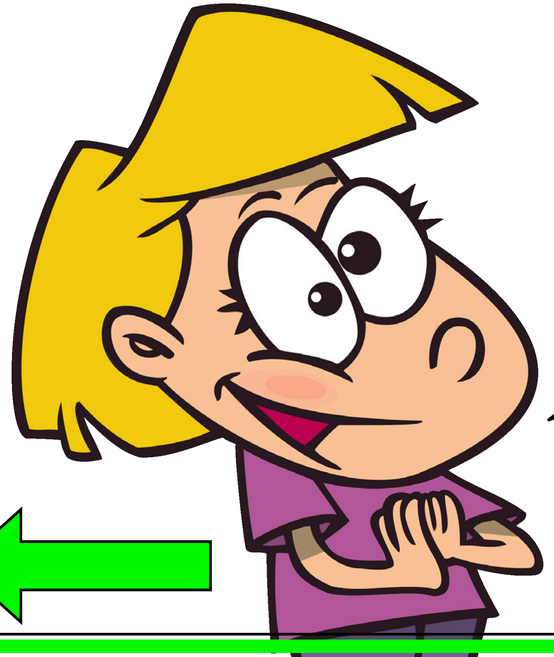



I'm making patterns by rotating a triangle around one point and tracing round it. I've managed to make a flower pattern with these two triangles, but...



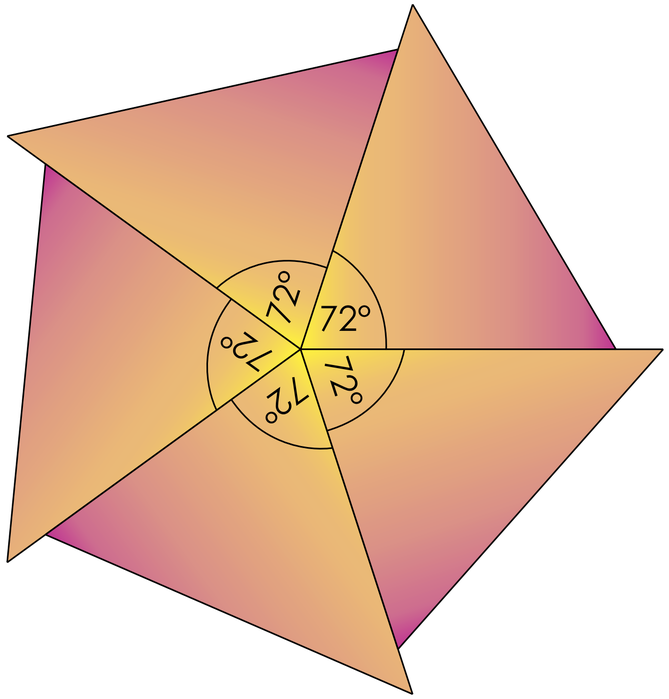



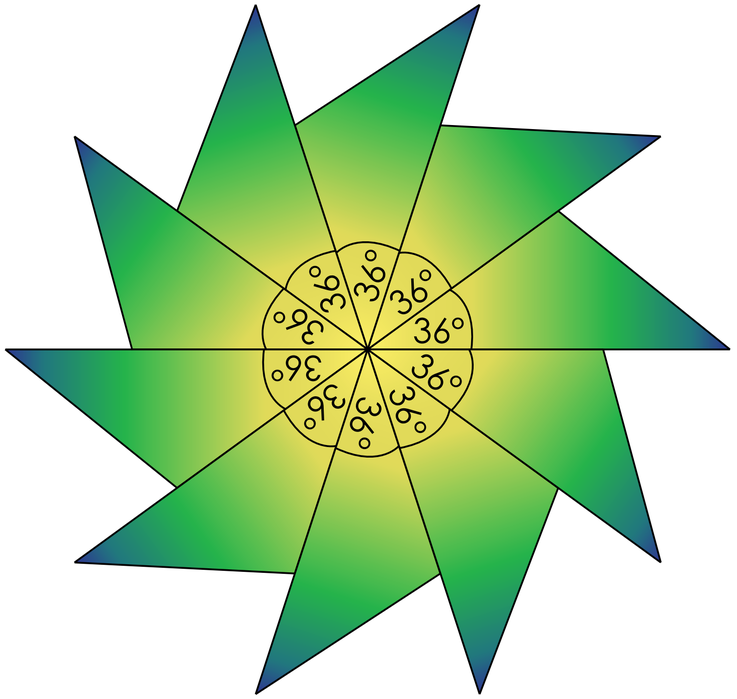



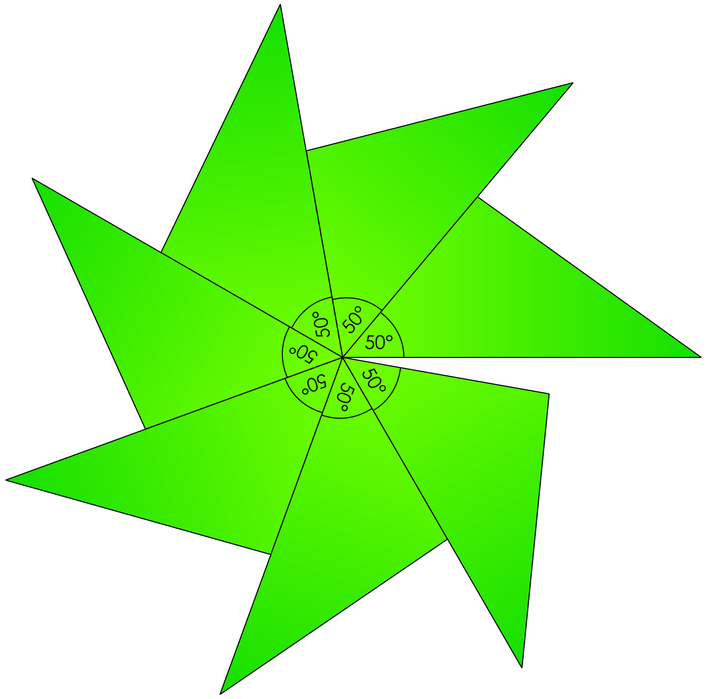



...this one's not working! When I rotate it around its 50° angle, it doesn't rotate exactly. I end up with a gap or with an overlapping pattern! Why is this happening?

**Discuss your ideas...**



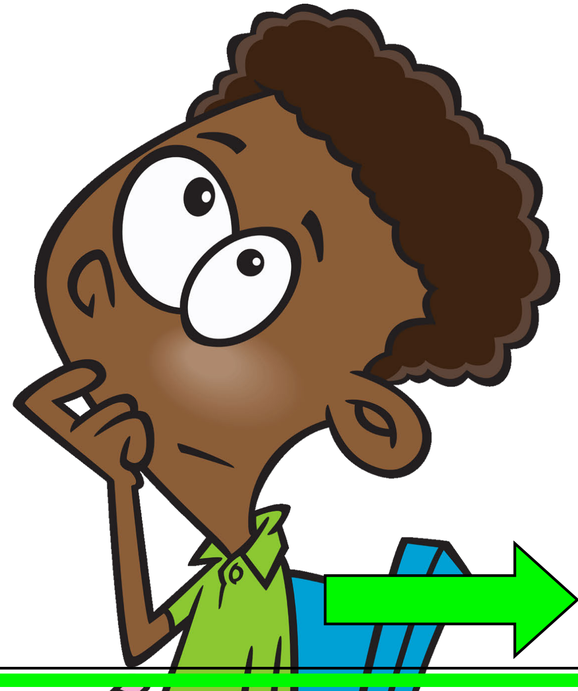



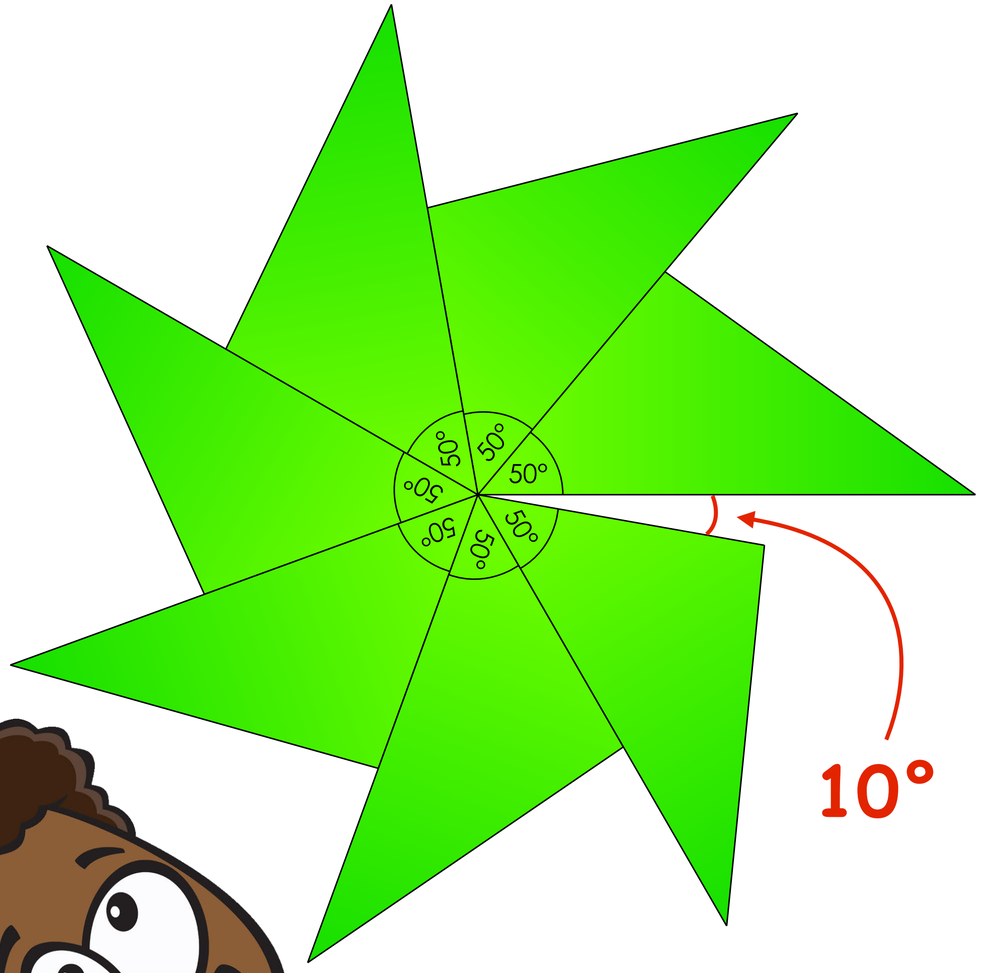



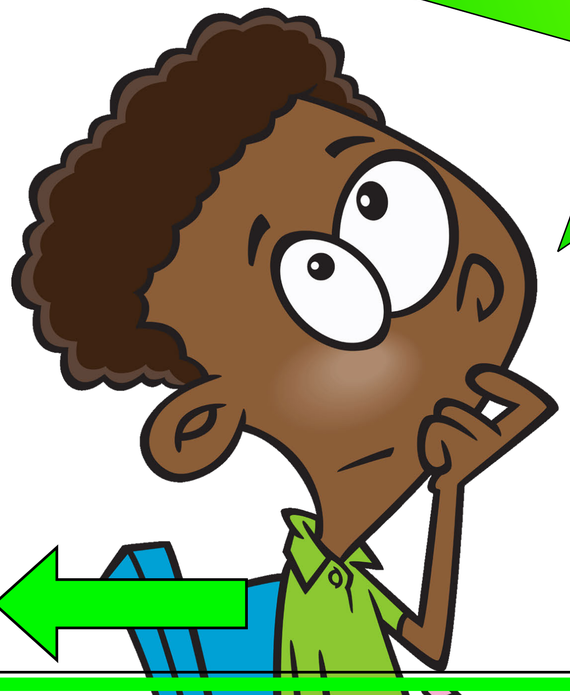

I think it's got something to do with 72 and 36 going exactly into 360:

**5×72=360** **360÷36=10**

I know that there are 360° in a full turn. I also know that 72 and 36 are **factors** of 360.





50 isn't a factor of 360:

**360÷50=7r10**

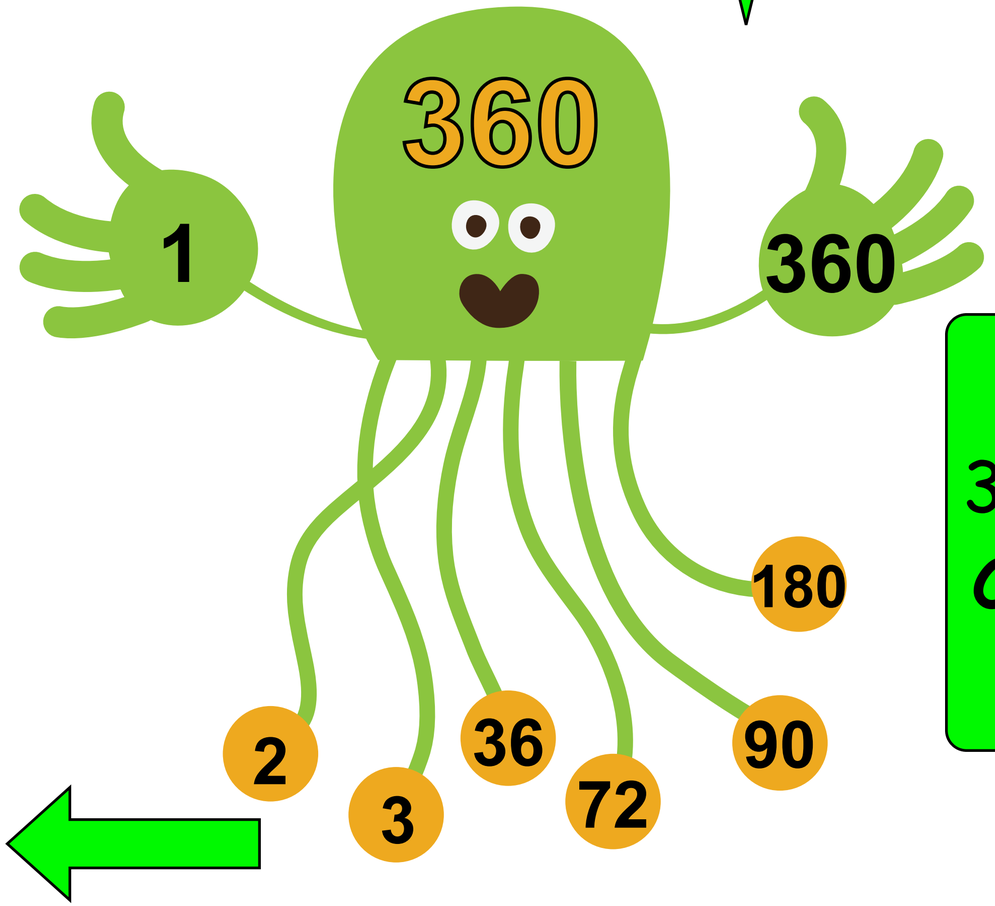
I think that's why this triangle won't rotate exactly!

**I wonder if other triangles with angles which are factors of 360 will rotate exactly?**

**CAN YOU FIND OUT FOR ME?**

I'm the Factorpus! Did you know that factors are smaller numbers that, when multiplied, go exactly into a larger whole number?

I've found these factors of 360. I know they're factors because I can divide 360 by them and there's no remainders:




360÷2=180
360÷3=120
360÷36=10
360÷72=5
360÷90=4
360÷180=2

The Factorpus has only found six factors of 360 so far, but there are actually twenty-two! **Can you find the rest? You could draw your own Factorpus to help you!**