What's Your Angle

Level E

If we can't all be stars, maybe we can draw them.
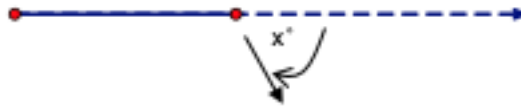
Drawing Process

Step 1: Record your beginning point and orientation (the relative position and direction that you will draw).
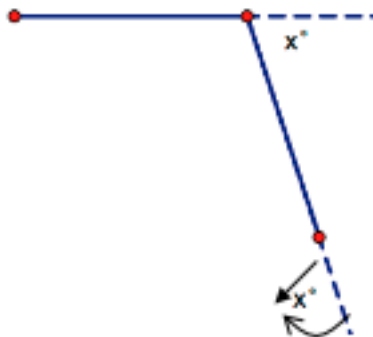
Step 2: Draw a line segment 5 centimeters in length in the direction you are oriented.

Step 3: At the end of your line segment, turn your orientation **x** degrees clockwise.

Step 4: If you reached your starting point, then stop. Otherwise, continue by going back to Step 2.
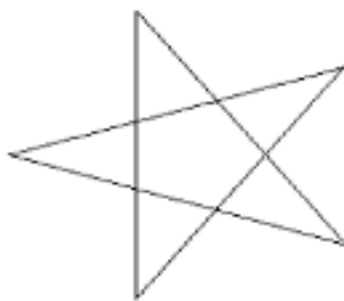
1. Try out this drawing process, inserting 90 degrees for **x**. What figure was drawn? How would you have known without having to actually draw the figure?

2. Use the drawing process with **x** = 72˚. What figure is drawn? Explain how you know without drawing.

3. Use the drawing process with x = 80^0. What figure is drawn? Explain how you know without drawing.

4. For the figure below, determine the interior angle of each point of the star and the exterior angle needed to make the turn in the drawing procedure in order to draw the figure.

5. For the figure below, determine the interior angle of each point of the star and the exterior angle needed to make the turn in the drawing procedure in order to draw the figure.
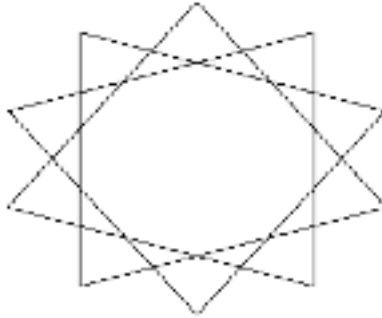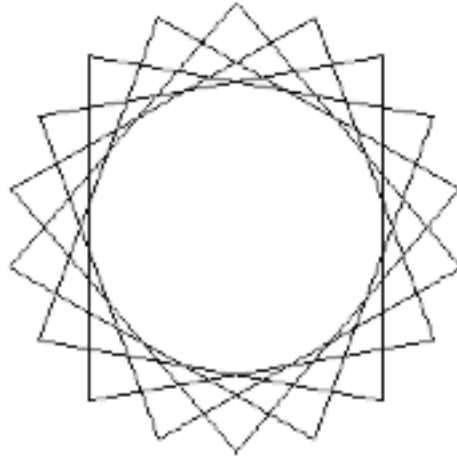

6. For the figure below, determine the interior angle of each point of the star and the exterior angle needed to make the turn in the drawing procedure in order to draw the figure.

Determine a generalized procedure for finding the interior and exterior angles of a star-shaped figure. Explain the mathematics behind your process. How do you know it always works?

7. Test your procedure on the following two-star figures.

Explain how you might predict how many points a star will have, given the turning angle of x degrees.