

A Logo Brain Challenge For Circles

We know how to make circles using a simple repeat command such as:

```
REPEAT 360[FD 1 LT 1]
```

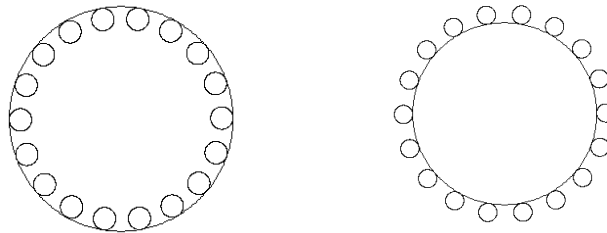
We know that the circle is really a many-sided polygon where the number of repeats and number of turns (LT or RT) must equal 360. We also know that we can change the size of the circle by increasing or decreasing the FD value.

We can do something kind of tricky and put a repeat command inside of a repeat command. For example, this command will draw this graphic. Think about how it works. It might be easier to “read the procedure from the inside out”—look first at the inner repeat command and brackets and then at the outer repeat command and brackets.

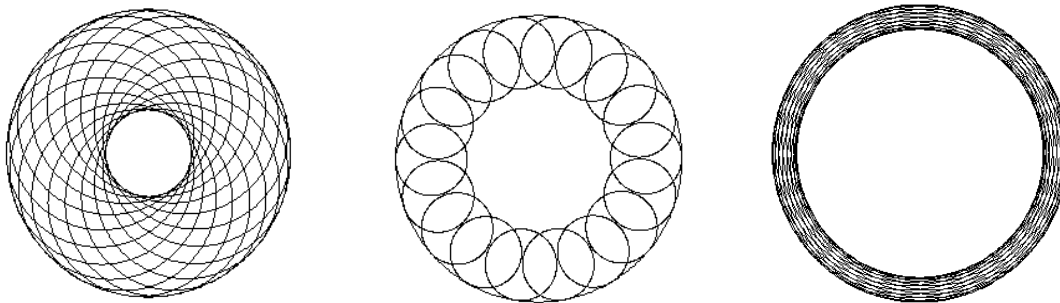
```
REPEAT 8[FD 50 REPEAT 360[FD .3 LT 1]]
```



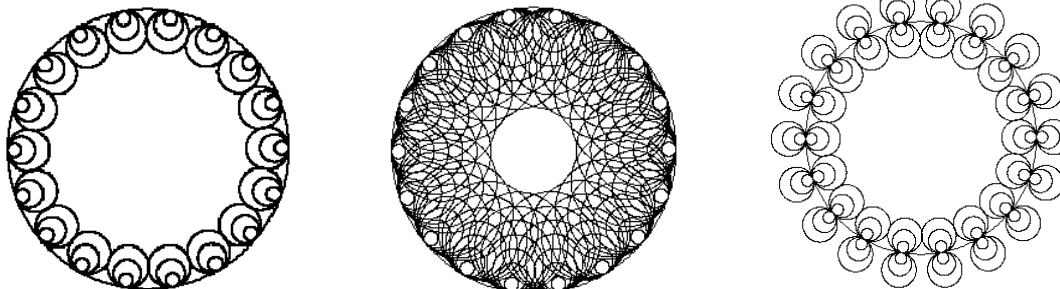
One might refer to the above procedure as “two nested repeat commands.” Now, apply the above information to draw the following figures. *Think carefully about what the turtle needs to do.* How would you make the straight-line curve? Start simple. There is more than one way to solve this puzzle. (Hint: one way to do it is with three nested repeat commands):



The two graphics above have only one letter different in their procedures. If you can make a procedure that draws either of the above graphics, by changing only one letter or number in the procedure you can create the following graphics:



With a few more little changes:



Can you write procedures to draw these graphics?