

Logo Activity 4 Making Polygons

In this activity you will learn to make regular polygons. The regular polygon we will create will be close shapes with equal angles and equal sides. To make an equilateral triangle with sides 100 steps long you would type the command:

```
Repeat 3 [FD 100 RT 120]
```

The turtle moves forward 100 and turns right 120 degrees three times to draw the triangle. After the turtle has turned 3 x 120 degrees, it is back to its original position. To make the total trip the turtle goes 300 steps.

To make a square with sides 100 steps long, you would need to type in the following command:

```
REPEAT 4 [FD 100 LT 90]
```

Once again the turtle ended in its original position and has turned 4 x 90 degrees or a total of 360 degrees.

If you are trying to make a regular polygon, the number of REPEATs x the angle will always equal 360 degrees.

So, if you are trying to draw an octagon (8 sides), you know the number of REPEATs will be 8 and the angle will be $360/8$. An easy way to find this value is type in the following command. This is Logo's calculator!

```
PRINT 360/8 → 45 degrees
```

The octagon can be created with the following command.

```
REPEAT 8 [FD 100 RT 45]
```

Or try letting the computer do the math ...

```
REPEAT 8 [FD 100 RT 360/8]
```

*This leads us to the **TOTAL TURTLE TRIP** Theorem:*

of turns (or sides) x # of degrees for each turn = 360 degrees

Each exterior turn = $360 / \#$ of turns (or sides)

Logo Assignment #4

Name: _____

- 1) Draw a pentagon (five equal sides and five equal angles). How many degrees is one of the angles for the pentagon? What command did you finally use?
- 2) What command produces a polygon that looks like a circle?
- 3) What command produces an arc that is a half circle?
- 4) Create a 5 pointed star and report the command below.

Extra Credit:

- 1) Create a six pointed star with just one REPEAT statement. Report the command below.