

Unit 1: Skill Builder 3 - Turtle Drive

Goals:

You will write a program on the calculator to trace a square using the Rover. Next you will write a program to create other regular polygons. Lastly you will write a program to drive a path on a given map.

1. Write a TI BASIC program that uses turtle drive to navigate a path.
2. Discover basic properties of regular polygons.
3. Explore the physical geography of Mars .

Background:

In computer science and computer graphics, **Turtle commands** are those where the present position, the “turtle”, is commanded to go to the next position by first turning to the appropriate direction and then moving forward a defined distance to reach the next point. In mathematics, this concept is known as a *vector*, something that has direction and size.

Rover Command	Example	Behavior
Wait <i>time</i>	Wait 2	Program waits for 2 seconds and does nothing
Output(<i>line</i> , <i>number</i> , <i>prompt string</i>)	Output(3, 1, "Angle =") Output(3, 9, A)	Display Angle = 60 on line 3 when the variable 'A' is set to 60
For(<i>index variable</i> , <i>start</i> , <i>stop</i>) End	For(n, 1, 10) ... End	Repeats commands within structure 10 times with the loop count in variable n.
RV LEFT <i>angle</i> UNIT	RV LEFT 60	Rover makes a left hand* 60° spin (if the angle is omitted it will turn 90°)
RV FORWARD <i>distance</i> <i>unit</i>	RV FORWARD 1.2 M	Go forward 1.2 M at default speed of 0.20 M/S

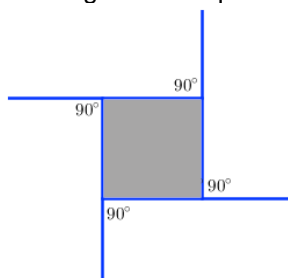
* The LEFT and RIGHT turns are made with a frame of reference from Rover's driver's seat.

Challenges:

Challenge 1: Write a program named “u1c1” that drives a square with an edge length of 0.5M.

- ☐ Task 1: Can you come up with two methods to draw a square? (one that uses less lines of code than the other)

Hint: Exterior Angles of a Square add up to 360°



Challenge 2: Write a program named “u1c2” that drives a polygon, with an edge length of 0.3M.

- ☐ Task 1: Write a program that drives a polygon with 5 sides (with an edge length of 0.3M)
- ☐ Task 2: Modify your program to drive a polygon with 6 sides. (with an edge length of 0.3M)
- ☐ Task 3: Finally, modify your program to drive a polygon with as many sides as you like, up to 30.
- ☐ Extension: Create a program that that asks the user how many sides, and then have the Rover draw that polygon.