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Chapter 8

INTRODUCTION TO DRAWING WITH LOGO

A Laboratory Exercise

By

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In this chapter we learn to use the graphical program MSWLogo. This is free software we downloaded from the LOGO Foundation web site at <http://el.www.media.mit.edu/groups/logo-foundation/index.html> . It can be located from the links area of “our” site www.k-12prep.math.ttu.edu .

Load LOGO from the same start window as with MAPLE. Commands are entered on the bottom line of the “Commander” window and recorded in the top portion of the window. The effect of the commands is seen in the full MWSLogo screen. Try the command **HT** (Enter) and see what happens.

The little triangle (wedge, or pointer if you wish) is called the turtle. Its home is the center of the graphics window facing due north (up). Now try the command **ST**. The "S" stands for "show", what do you think the "T" stands for?

What do you think **HT** might stand for?

Think of the turtle crawling around the screen with an ink pen attached to its tail and experiment with each of the following command sequences in the commander window. Pressing the return key produces the corresponding effects. In each case below describe the effect produced by the command sequence and state what you think the command is an abbreviation for. **Note the spacing is important!**

(If you draw a line you don't want, try erasing it with the command **PE**, pen erase, followed by reversing the command that drew the line in the first place. Of course after doing this you must turn the pen back to the drawing position before any more lines can be drawn. The command for doing this is **PPT**, pen paint.)

FD 100	
RT 90	
FD 100	
HOME	
LT 90	

BK 100

RT 90 FD 100

LT 30 FD 100

LT 120 FD 100

LT 75

FD 200 (oops)

PE BK 200 PPT

FD 141.42

HT

Attach a printout of your picture. (Choose **Bitmap** from the bar menu then choose **Print**.)

Indicate with arrows, the path the turtle took to draw this picture. Does this represent a traversable network?

Explain.

Explain where the number 141.42 came from. (Hint: the answer lies in ancient Greece.)

Continue the exercise with the following command sequences:

CS

ST

PU FD 100

ARC 360 100

RT 120

ARC 120 50

PU SETXY 40 40

PD ARC 360 10

PU SETXY -40 40

Provide the command sequence to finish the picture.

Continue the exercise as above.

CS

SETXY 100 200

SETXY 100 -200

SETXY -100 200

SETXY -100 -200

SETXY 0 0

Explain the effect of the command **SETXY**.

The following exercises show us that LOGO has calculating capabilities in addition to it's graphing interface. In fact, as seen in some of the exercises, calculations can be used in conjunction with the graphing commands.

2+2

PRINT 2+2

SQRT 4

PRINT SQRT 4

FD SQRT 2500

POWER 10 3

PRINT POWER 10 3

RT 30 FD POWER 10 2

RT 30 BK POWER 10 3

RT 360-90

SIN 45

PRINT SIN 45

ARCTAN 1

PRINT ARCTAN 1

LT ARCTAN 1


FD 100*SIN 45

PRINT SQRT ((POWER 10 2)+(POWER 10 2))

Multiple commands can be put on the same command line separated by spaces and executed by a single pressing of the return key.

Sketch the result of the following command sequence:

HOME CS RT 45 FD 100 LT 90 FD 100 HOME



Now fill in the missing commands to draw a right triangle "in general position." (You can't use the HOME command.) You have to use some trig.

FD 100 RT 90 FD 100
RT
FD

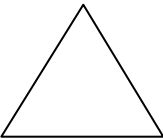
This sequence is called a "program," or a "procedure."

Repeat the above exercise (**right triangle in general position**) with the following beginning command sequence: (see next page)

FD 100 RT 90 FD 130
RT
FD

In each of the following exercises write a "procedure/program" which produces the given object in general position. Also no other marks should appear on the screen, including the turtle.

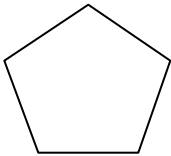
1. Equilateral triangle



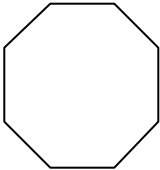
2. Square



3. Pentagon



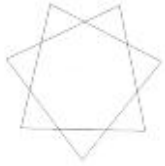
4. Octagon



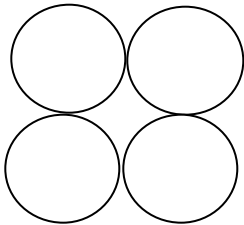
5. Regular 5 pointed star



6. Regular 7 pointed star



7. Four stacked circles



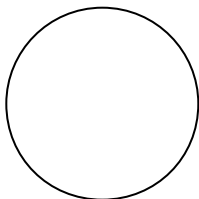
Notice how some of the above had the same simple command sequence repeated a number of times. There is a built in shortcut for writing such programs. Execute the following command:

REPEAT 4[RT 90 FD 100]

Explain what this command appears to be doing.

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8. Regular 20 Sided polygon



9. Using the **REPEAT** command provide the “one Statement” command which produces each of the above figures

1.

2.

3.

4.

5.

6.

7.