11.6 Parametrics in the Calculator Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**PART 1 The Basics**

Let 





1. Change your calculator’s mode to PARAMETRIC.
2. Type in the above parametric equation into x1T and y1T.
3. Change the window to following:

Tmin=0

Tmax=4

Tstep=0.1

Xmin=-5

Xmax=5

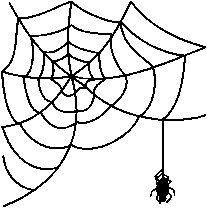
Xscl=1

Ymin=-5

Ymax=5

Yscl=1

1. Graph your parametric equation. Make note of the domain & range of the graph.
2. Change the value of “Tstep” to .01. What changed about the graph?
3. Change the value of “Tstep” to 1. What changed about the graph?
4. Change the value of “Tstep” back to 0.1. Now change your “Tmax” and “Tmin” values. What changes about the graph?
5. Now graph the parametric function . Predict what will happen when you change your values of Tmin, Tmax, and Tstep.
6. Summarize what happens when you change the values of Tmin, Tmax, and Tstep when graphing parametric equations in your calculator.

**PART 2. Spider and the Fly**

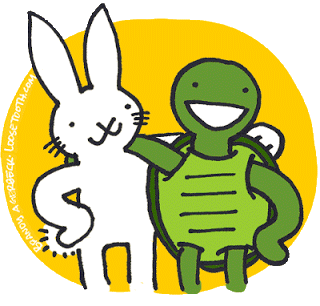
The spider is 1T



The fly is 2T



* Change your calculator’s mode to RADIANS, PARAMETRIC, and SIMULTANEOUS. This will graph your 2 equations at the same time.
* Change the WINDOW to [-5, 5] by [-5,8] with 0≤T≤5 and Tstep =.05
* Explore the path of the spider and the fly by using the trace button with the up and down arrow keys.

Does the spider catch the fly? Why or why not?

**PART 3. The Race**

The hare wanted to have a fair race with the turtle, since he can spring at 24 ft/sec while the very best that the turtle can do is 18 ft/sec. The hare gives the turtle a 15 ft head start.

Parametrics can be used to model the race.

Turtle: 

Hare: 

Mode: PARAMETRIC and SIMUL

1. Find a good window with a Tstep of .01.

Tmin =

Tmax =

Xmin =

Xmax =

Ymin =

Ymax =

1. If they race for 50 feet, who wins the race?
2. If they race for 75 feet, who wins the race?
3. Who is ahead at 3 seconds? HINT: Use t=3.
4. At what time does the hare overtake the turtle? HINT: Use an algebraic inequality.