Lab The Fourth-and-a-Half
Spring is Upon Us
Due Monday, April 4, at 5PM

To honor the change of season, you'll be using Maple to plant flowers and watch them grow.

1 Planting the Flowers

To make mathematics out of horticulture, you'll be looking at the family of polar graphs

$$r = a + b\sin(c\theta)$$

for different parameters a, b, and c. Your primary objective is to determine the effects that a, b, and c have on the graph of the equation.

To get maple to plot in polar coordinates, use the following syntax:

```
with(plots):

polarplot(a+b sin (c*t), t=0..2*Pi);
```

You will, of course, be changing up a, b, and c. The nicest graphs come from integral values of c, and values of a between 0 and 1, but try other values as well.

2 Watching the Flowers Grow

In this section, we animate a family of graphs. Begin with the following example....

```
animate(polarplot, [(1/2)*A+2*A*sin(A*t), t = 0 .. 2*Pi], A = 0..10, frames = 200);
```

Maple will plot 200 frames of a movie that changes over the range of A values given. For these plots the values of a, b, and c are related by $a = \frac{1}{2}b = \frac{1}{4}c$. You'll have a play/pause button at the top of your screen to watch your animation. For this part, you should play around with the parameters and the animate feature to create interesting movies. This family of graphs is particularly nice for this feature, but one can animate any set of graphs with a parameter.

For this lab, please submit a brief LaTeXdocument of your findings in the first part, as well as a Maple Worksheet with your 'interesting plots'. As there is an aesthetic component to this endeavor, use of colors and shading would be appreciated. The intention is for you to hand in your results at the end of the hour, but your work isn't due until Monday at 5PM.