

Using Maple to do 3D Graphing and Animations

Instructions For Opening Maple:

1. Log into Elmhurst Portal and scroll down to till you see Citrix and click on it, then again on the blue box that appears.
2. Underneath a green install button click on “skip to Log on” and enter your Elmhurst portal information again.
3. Click on the folder that says “mathematics” and then “maple 2017”
4. Click “permit use” when the window pops up.
5. Click on the box labeled “New Worksheet”

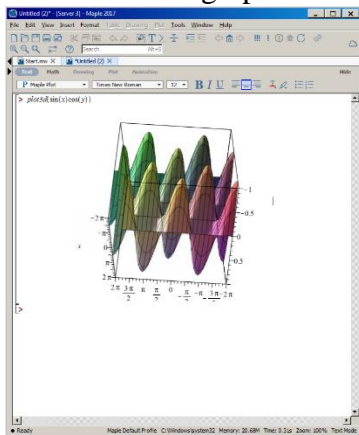


As seen here.

Maple Activity

Today we will be using Maple to graph things in 3D and then using the animations to see how these graphs could change.

- To begin, type “`plot3d(sin(x)cos(y))`”. Press enter. This is a basic graph to show how the 3d looks on the graph. You should see this.



- Notice the ranges are automatically set to $-2\pi..2\pi$
- Use your mouse to rotate the graph.

Animations:

Now that we have figured out how to graph in 3D, we will try to create animations with these graphs.

- Type “`with(plots);`” and you should see the following.

```

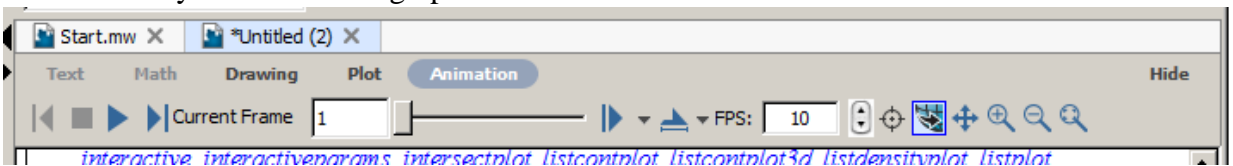
> with(plots);
[animate, animate3d, animatecurve, arrow, changecoords, complexplot, complexplot3d, conformal,
conformal3d, contourplot, contourplot3d, coordplot, coordplot3d, densityplot, display,
dualaxisplot, fieldplot, fieldplot3d, gradplot, gradplot3d, implicitplot, implicitplot3d, inequal,
interactive, interactiveparams, intersectplot, listcontplot, listcontplot3d, listdensityplot, listplot,
listplot3d, loglogplot, logplot, matrixplot, multiple, odeplot, pareto, plotcompare, pointplot,
pointplot3d, polarplot, polygonplot, polygonplot3d, polyhedra_supported, polyhedraplot,
rootlocus, semilogplot, setcolors, setoptions, setoptions3d, shadebetween, spacecurve,
sparsematrixplot, surfdata, textplot, textplot3d, tubeplot]
> [

```

(1)

● Ready Maple Default Profile C:\Windows\system32 Memory: 20.68M Time: 0.31s Zoom: 100% Math Mode

- You don't have to do anything with the blue words, they are just all the uses of the animations
- Next type “animate3d(cos(t*x)*sin(t*y), x = -Pi .. Pi, y = -Pi .. Pi, t = 1 .. 2)”
 - This will give you a graph and you will be able to play with the animation settings when you click on the graph. The bar look like this:



Activities:

1. Graph “animate3d(cos(t*x)*sin(t*y), x = -Pi .. Pi, y = -Pi .. Pi, t = 1 .. 2)” After you do this go to the next line and add “,color=cos(xy) after the 2”

What does this do to the graph color wise, and what does this color change mean? How could this be helpful?

2. Type: `animate(plot3d, [A*(x^2+y^2), x = -3 .. 3, y = -3 .. 3], A = -2 .. 2, style = patchcontour)` and make observations about what “A” is doing and how the graph changes.

3. Type an equation into the `animate3d(.....)` or `animate(plot3d,[.....].)` and see what happens. What equation did you use and what happened with yours versus the others? If you got an error, what do you think was wrong and how can you fix it? Try again

