

Extra Credit Take Home:

Recently I have become acquainted with this new thing called the world wide web (www). Many of you may have heard of it too. There are all sorts of neat things on it. I like to use a search engine to find my way around the www. My favorite search engine is

duckduckgo.com

I have heard of others as well. But one of the reasons I like duckduckgo.com is because of its ability to do mathematics (of course). For example

1. To graph $y = x^2$, I only need to search (notice the funny !wa at the end)

$Plot[x^2, \{x, -1, 1\}] !wa$

2. To graph $z = x^2 + y^2$, I only need to search

$Plot3d[x^2 + y^2, \{x, -1, 1\}, \{y, -1, 1\},] !wa$

3. And to graph $x^2 + y^2 + z^2 = 1$, I only need to search (well this only plots the upper half plane).

$Plot3D[(1 - x^2 - y^2)^{(1/2)}, \{x, -1, 1\}, \{y, -1, 1\}] !wa$

Use duckduckgo (or other graphing resources like Maple on the computers in the NAB 109 and NAB111) to graph $x^\infty + y^\infty = 1$ and $x^0 + y^0 = 1$. Well maybe won't graph these directly; let's try the following:

1. First graph $x^2 + y^2 = 1$, $x^4 + y^4 = 1$ and $x^8 + y^8 = 1$ and predict what $x^\infty + y^\infty = 1$ will look like.
2. Now graph $x^2 + y^2 = 1$, $|x| + |y| = 1$, $|x|^{1/2} + |y|^{1/2} = 1$, and $|x|^{1/10} + |y|^{1/10} = 1$. Use these to predict what $x^0 + y^0 = 1$ will look like.

I would like you to graph $x^\infty + y^\infty = 1$, $x^2 + y^2 = 1$, $|x| + |y| = 1$ and $x^0 + y^0 = 1$. Of course my favorite graph is $|x|^{0.57} + |y|^{0.57} = 1$ Please graph this as well.