

DP Graph Experimentation

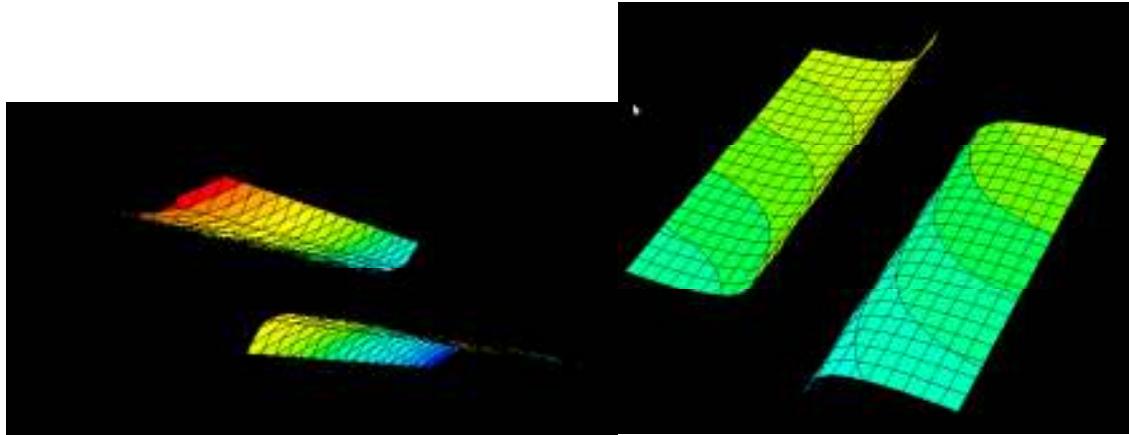
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I wanted to see how changing exponents in the equation would change the image I got back.

The first thing I did was change the equation from “graph3d(a*x^2+b*y^2*sin(c*time)=d*z^2)” to “graph3d(a*x^1+b*y^1*sin(c*time)=d*z^1)”. The shape I got was a plane, which made sense. I just learned about planes in Calculus III today.

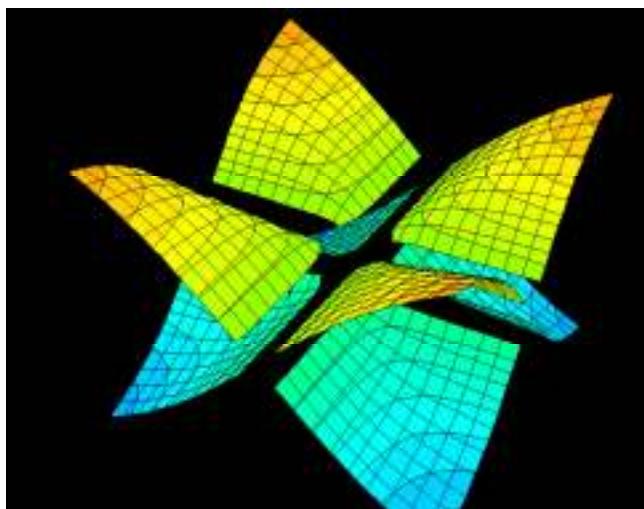
Next I wanted to know what would happen if I make one or more of the exponents negative.



I got two slightly curved sheets when I made the x exponent -1.

In class I had been making all the exponents larger, which gave me large, elaborate shapes. If I did the same but put a negative sign in front of the exponent, would it have a similar effect?

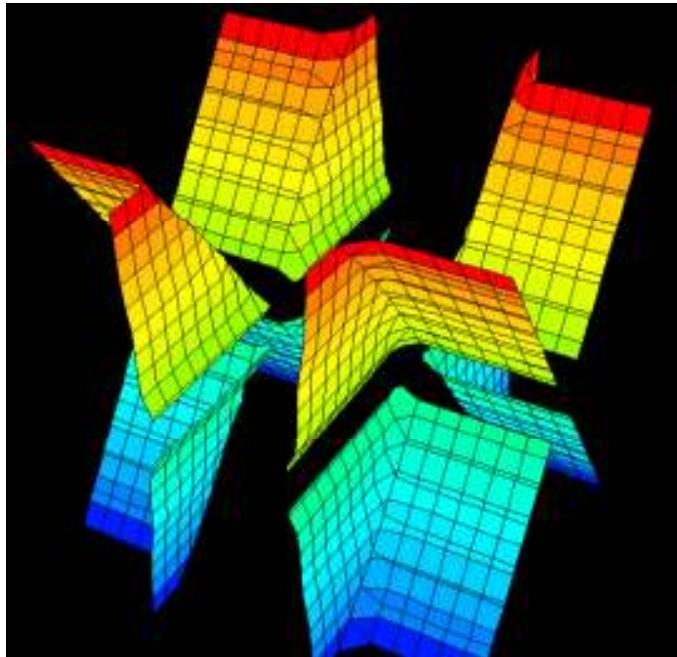
I changed the equation to “graph3d(a*x^-2+b*y^-2*sin(c*time)=d*z^-2)”.



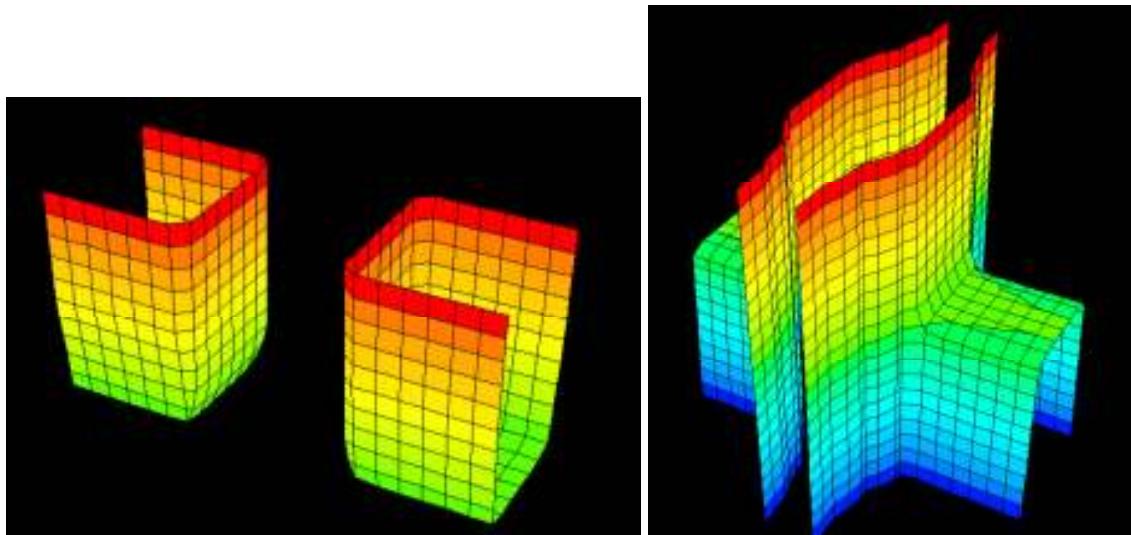
The shape now had eight curved sheets. Making the exponents more negative seemed to increase the number of curved sheets. Then I changed the equation to “graph3d(a*x^-20+b*y^-20*sin(c*time)=d*z^-20)”.

20)", which gave me basically the same shape. Maybe if I made one exponent more negative than the others it would increase the number of sheets.

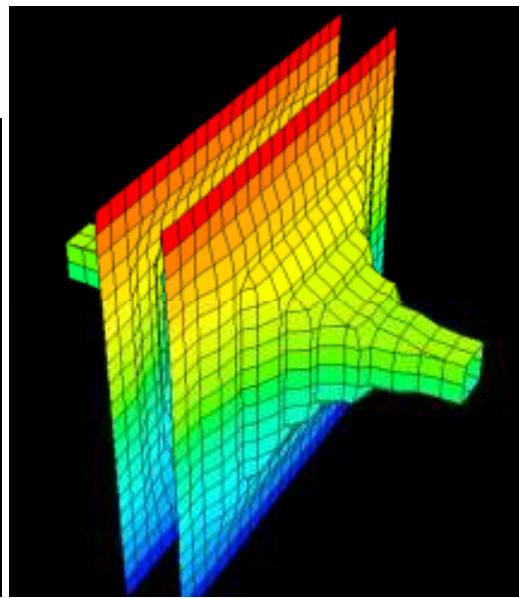
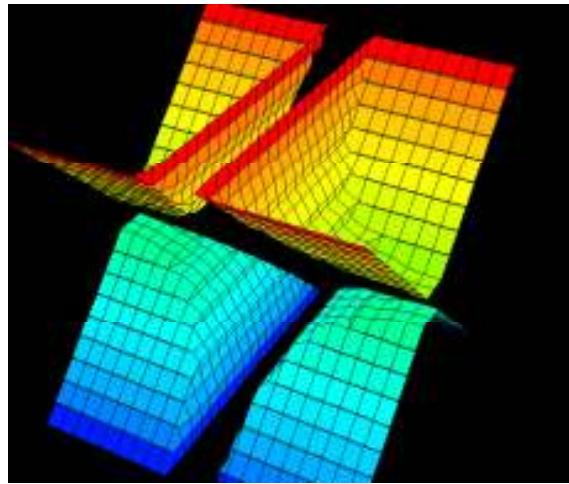
The equation "graph3d(a*x^-20+b*y^-2*sin(c*time)=d*z^-2)" gave me a moving figure that went from eight curved sheets to two x's.



What if I made one exponent very negative and another one positive? The equation "graph3d(a*x^-20+b*y^20*sin(c*time)=d*z^1)" gave me a very interesting shape:



I had made the exponent of z a simple 1. I decided to change it to a positive 20.



It turned itself inside out, much like when the exponent of Z was just to 1. What if I made z negative?
Then I got a shape that looked like the previous one except cut in half with the halves rotated 180 degrees.

