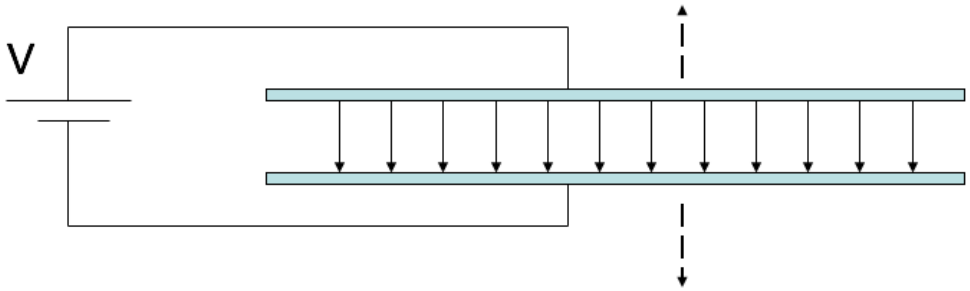


A parallel plate capacitor is attached to a battery which maintains a constant voltage difference V between the capacitor plates. While the battery is attached, the plates are pulled apart. The electrostatic energy stored in the capacitor

A. increases.
B. decreases.
C. stays constant.

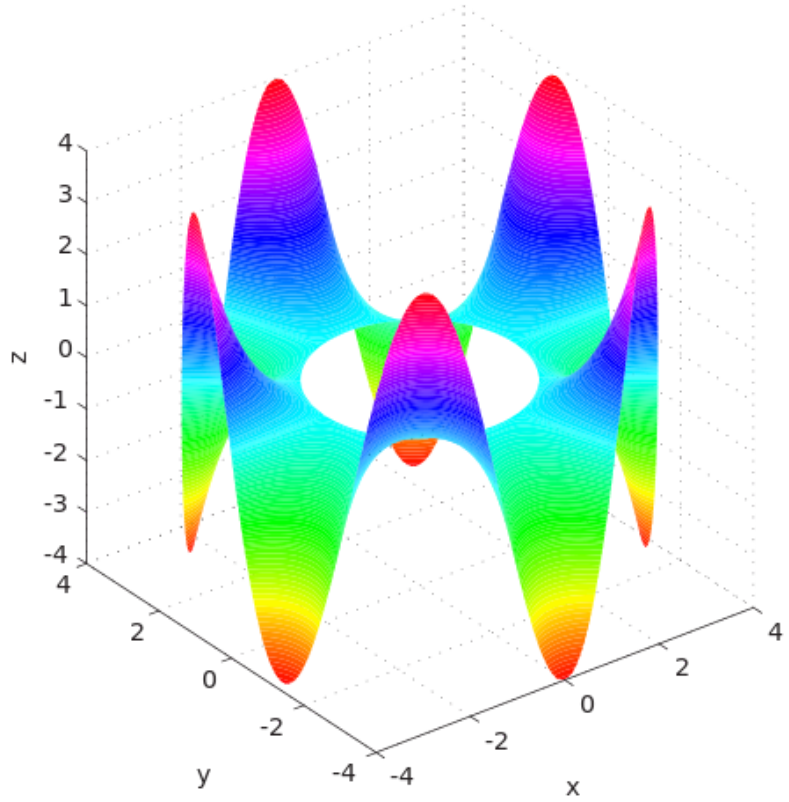
I feel that Exam 1 was a fair assessment.

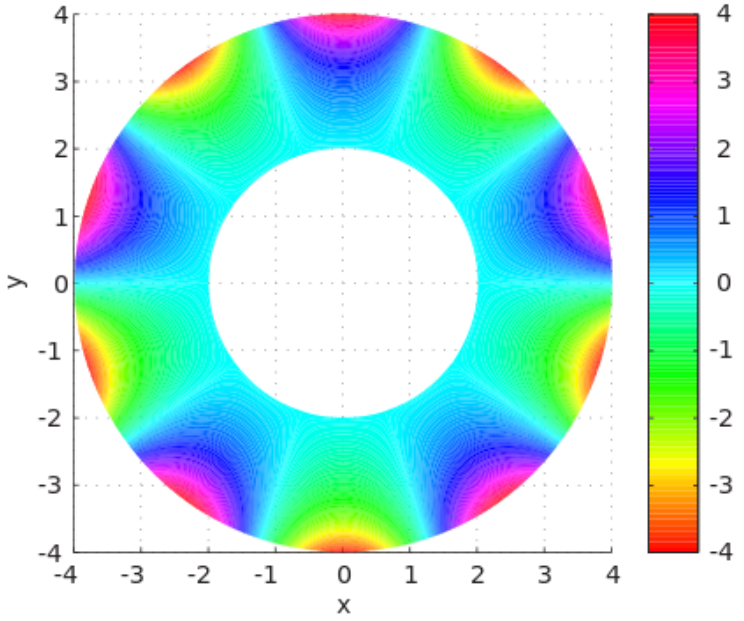
A. Strongly Agree
B. Agree
C. Neither Agree/Disagree
D. Disagree
E. Strongly Disagree

I feel that Exam 1 was aligned with what we have been doing (in class and on homework).

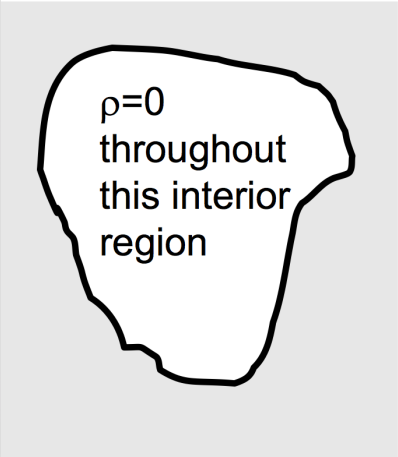
A. Strongly Agree
B. Agree
C. Neither Agree/Disagree
D. Disagree
E. Strongly Disagree

LAPLACE'S EQUATION





A region of space contains no charges. What can I say about V in the interior?

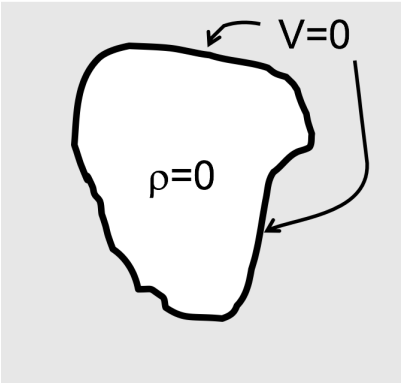


A. Not much, there are lots of possibilities for $V(r)$ in there

B. $V(r) = 0$ everywhere in the interior.

C. $V(r)$ =constant everywhere in the interior

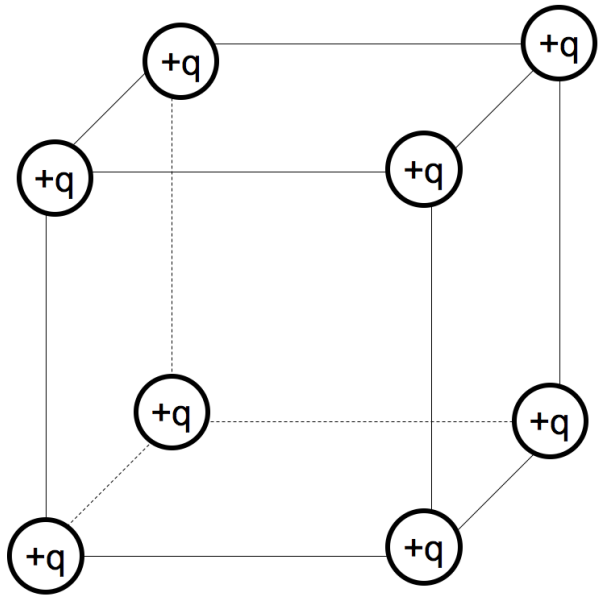
A region of space contains no charges. The boundary has V=0 everywhere. What can I say about V in the interior?



A. Not much, there are lots of possibilities for $V(r)$ in there

B. $V(r) = 0$ everywhere in the interior.

C. $V(r) =$constant everywhere in the interior



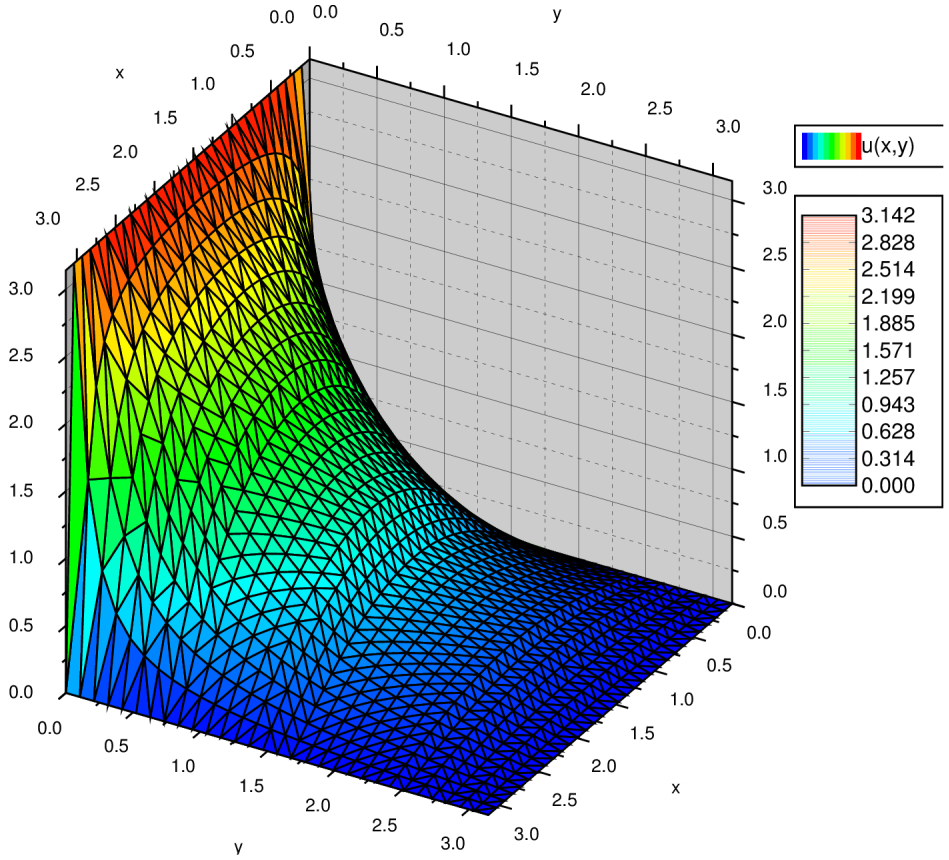
If you put a positive test charge at the center of this cube of charges, could it be in stable equilibrium?

A. Yes

B. No

C. ???

SEPARATION OF VARIABLES (CARTESIAN)



Say you have three functions $f(x)$, $g(y)$, and $h(z)$. $f(x)$ depends on x but not on y or z. $g(y)$ depends on y but not on x or z. $h(z)$ depends on z but not on x or y.

If $f(x) + g(y) + h(z) = 0$ for all x, y, z, then:

A. All three functions are constants (i.e. they do not depend on x, y, z at all.)
B. At least one of these functions has to be zero everywhere.
C. All of these functions have to be zero everywhere.
D. All three functions have to be linear functions in x, y, or z respectively (such as $f(x) = ax + b$)

If our general solution contains the function,

$$X(x) = Ae^{\sqrt{c}x} + Be^{-\sqrt{c}x}$$

What does our solution look like if $c < 0$; what about if $c > 0$?

A. Exponential; Sinusoidal
B. Sinusoidal; Exponential
C. Both Exponential
D. Both Sinusoidal
E. ???

Our example problem has the following boundary conditions:

- $V(0, y > 0) = 0; V(a, y > 0) = 0$
- $V(x_{0 \to a}, y = 0) = V_0; V(x, y \to \infty) = 0$

If $X'' = c_1 X$ and $Y'' = c_2 Y$ with $c_1 + c_2 = 0$, which is constant is positive?

A. c_1

B. c_2

C. It doesn't matter either can be