Announcements

- Homework 5 due tonight!
  - Take a look over comments from the graded HW4 to make sure you aren't forgetting anything on your plots!
- Those test polling results. . .
- Have read Ch 3.3.2 by Wednesday

Q1

Say you have three functions $f(x)$, $g(y)$, and $h(z)$. Each function only depends on it's single variable, and not on the others. If

$$f(x) + g(y) + h(z) = 0$$

for all x, y, z, then:

A. All three functions must be constant (i.e. they do not depend on x, y, z at all)
B. At least one of the functions must be equal to 0 everywhere
C. All of the functions must be equal to zero everywhere
D. All three functions must be linear (e.g. $f(x) = ax + b$, $g(y) = cy + d$ etc.)

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Q2

Say our general solutions contains the expression:

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

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

A. Exponential, and Sinusoidal
B. Sinusoidal, and Exponential
C. Both Exponential
D. Both Sinusoidal

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Q3

Given the two differential equations:

$$\frac{1}{X}\frac{\mathrm{d}^2 X}{\mathrm{d}x^2} = C_1 \quad \text{and} \quad \frac{1}{Y}\frac{\mathrm{d}^2 Y}{\mathrm{d}y^2} = C_2$$

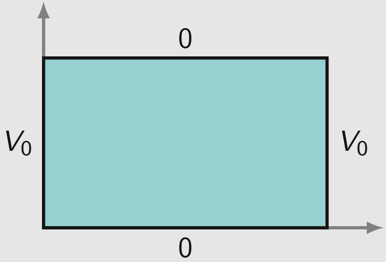
where $C_1 + C_2 = 0$. Given the boundary conditions in the below figure, which coordinate should be assigned to the negative constant?

A. x

B. y

C. $C_1 = C_2 = 0$ here

D. It doesn't matter



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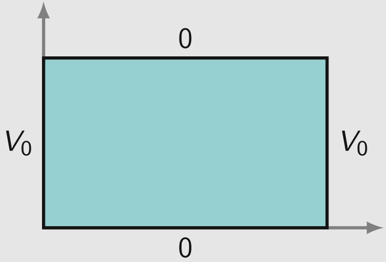

Q4

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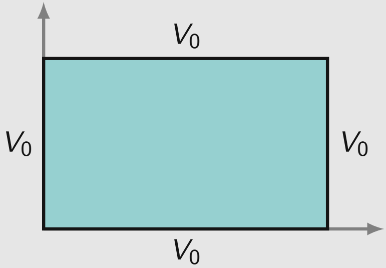

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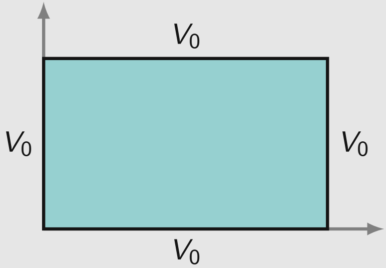

Q5

When would the boundary condition

$$V(x,a) = Ce^{-kx}\cos(ky) = 0$$

tell you?

A. It must be that $k = 0$

B. It must be that $k = \dfrac{n\pi}{2a}$

C. It must be that $k = \dfrac{n\pi}{a}$

D. It must be that $C = 0$

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Q6

What is the result of

$$\int_0^{2\pi} \sin(2x)\sin(3x)\,dx$$

A. 0
B. π
C. 2π
D. Give me another second, consulting Sympy...

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Q7

Why does Fourier's trick work to find the values of C_n?

A. Because the infinite sum of sine waves always approaches a constant

B. Because any function can be expressed as a sum of different sine waves

C. Because sine functions are orthogonal to one another

D. C and B

Q7

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