What is the value of

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

A) Zero

B) π

C) 2π

D) other

E) I need resources to do an integral like this!

$$V(x,y) = \frac{4V_0}{\pi} \sum_{n=1,3,5\ldots}^{\infty} \frac{1}{n} \sin(n\pi x / a)\, e^{-n\pi y/a}$$

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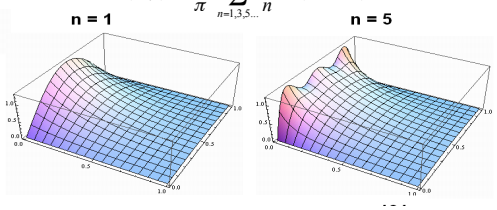
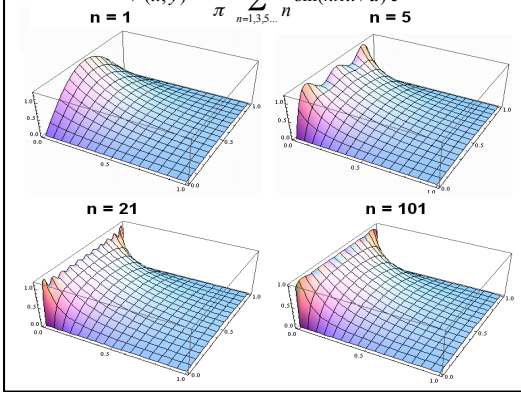


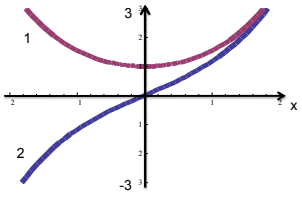
$$V(x,y) = \frac{4V_0}{\pi} \sum_{n=1,3,5\ldots}^{\infty} \frac{1}{n} \sin(n\pi x / a)\, e^{-n\pi y/a}$$



(Grab pp 3-4 when you are done with the first sheet)

A) DONE with page 1
B) DONE with page 2
C) DONE with page 3
D) DONE with page 4

Two solutions for *positive C* are sinh x and cosh x :



Which is which?
A)Curve 1 is sinh x and curve 2 is cosh x
B)Curve 1 is cosh x and curve 2 is sinh x

3.11 Given the two diff. eq's :

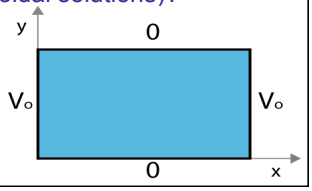
$$\frac{1}{X}\frac{d^2X}{dx^2} = C_1 \qquad \frac{1}{Y}\frac{d^2Y}{dy^2} = C_2$$

where $C_1+C_2 = 0$. Given the boundary conditions in the figure, which coordinate should be assigned to the negative constant (and thus the sinusoidal solutions)?

A) x B) y

C) $C_1 = C_2 = 0$ here

D) It doesn't matter



3.11 c Given the two diff. eq's:

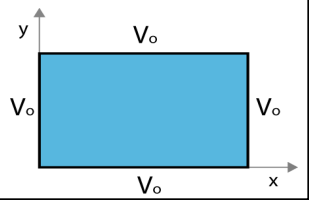
$$\frac{1}{X}\frac{d^2X}{dx^2} = C_1 \qquad \frac{1}{Y}\frac{d^2Y}{dy^2} = C_2$$

where $C_1+C_2 = 0$. Which coordinate should be assigned to the negative constant (and thus the sinusoidal solutions)?

A) x B) y

C) $C_1 = C_2 = 0$ here

D) It doesn't matter



3.11 h The X(x) equation in this problem involves the "positive constant" solutions:
A sinh(kx) + B cosh(kx)

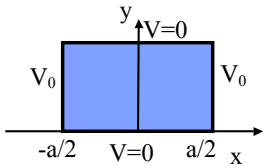
What do the boundary conditions say about the coefficients A and B above?

A) A=0 (pure cosh)

B) B=0 (pure sinh)

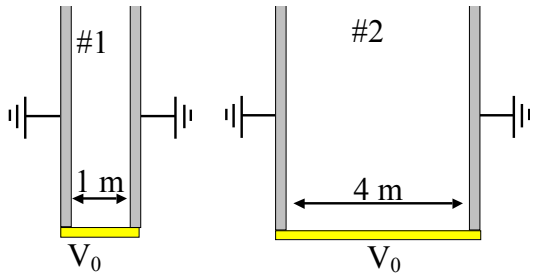
C) Neither: you should rewrite this in terms of $A' e^{kx} + B' e^{-kx}$!

D) Other/not sure?



3.14

2 troughs (∞ in z, i.e. out of page) have grounded sidewalls.
The base of each is held at V0.



3.14

$$V(x,y) = \frac{4V_0}{\pi} \sum_{n=1,3,5,\ldots}^{\infty} \frac{1}{n} \sin(n\pi x / a) e^{-n\pi y/a}$$

How does V(x,y) compare, 4 m above the middle of the base in the two troughs?

A) Same in each
B) 4x bigger in #1
C) 4x bigger in #2
D) *much* bigger in #1
E) *much* bigger in #2