

Homework #5: Phys 3320: Prof. Olness Fall 2010

Due Nov. 30

I've not set up example Mathematica files; refer to my book, or see me.

1) By hand, solve the 1-dimensional wave equation: (I recommend you use Sin terms):

$$\partial_t^2 f(x,t) = c^2 \partial_x^2 f(x,t)$$

Assume $f(x,t)=0$ for $x=0$ and $x=\pi$.

2) Using Mathematica:

- Plot solution for $t=0$ for the first 5 modes :
 - Animate the solution as a function of time.
(Set it up so you can choose the mode “k” and start the animation.)
-
-

Homework #6: Phys 3320: Prof. Olness Fall 2010

Due Nov. 30 (Before you leave for break)

I've not set up example Mathematica files; refer to my book, or see me.

1) By hand, solve the 2-dimensional wave equation: (I recommend you use Sin terms):

$$\partial_t^2 f(x,y,t) = c^2 \partial_x^2 f(x,y,t) + c^2 \partial_y^2 f(x,y,t)$$

Assume $f(x,y,t)=0$ for $x=0$ and $x=\pi$, and for $y=0$ and $y=\pi$,

2) Using Mathematica:

- Plot solution for $t=0$ for the first few modes :
- Animate the solution as a function of time.
(Set it up so you can choose the mode “ k_x ” and “ k_y ” and start the animation.)