Homework #5: Phys 3320:   Prof. Olness   Spring 2012

Due Monday April 16

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=π.

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   Spring 2012

Due Monday April 23

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=π, and for y=0 and y=π,

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.)