Fall 2020　　　ENG 5300　　　Quiz 4　　　Chaowei Li

You must show **all** work to receive full credit. All work is to be your own. | December 2
This is a closed books and notes test. Be organized.　　Total points: **24** | 19:50 - 19:55
Submit a single black/white pdf file to BB, named using your last name. | 20% noncompliance penalty

1. Determine wether the method of separation of variables can be used to replace the given partial differential equation by a pair of ordinary differential equations. If so, find the equations.

   20 points

$$u_{xx} + (x + y)u_{yy} = 0$$

2. §12.4 D'Alembert's Solution of the Wave Equation   4 points
   Show that because of the boundary conditions

$$\text{(a) } u(0,t) = 0, \qquad \text{(b) } u(L,t) = 0 \qquad \text{for all } t \geq 0$$

the function f in

$$u(x,t) = \frac{f(x+ct) + f(x-ct)}{2}$$

must be odd and of period $2L$.