Instructions: *You may consult the textbook and your notes, but you may not work with others. Turn the quiz in during class or via e-mail by 11:59pm, Monday, November 28.*

Quiz 12

1. (5 points) Consider the differential equation $y'' + y = \sin t$. (a) Find the general solution.
(b) Solve the boundary value problem $y(0) = 0$, $y(\pi) = 0$.

2. (5 points) Verify that $\{\cos^2 x, \sin^2 x, \sin x \cos x\}$ is a fundamental solution set for $y''' + 4y' = 0$.

(For fun) For the mass-spring system governed by $y'' + 2ay' + y = \sin(\omega t)$, $a > 0$, find the amplitude of the oscillation for varying $\omega > 0$. How does this differ from the undampened $a = 0$ case?