Math 244 Quiz 4

Names: _____

1. Let λ be some real number and consider the differential equation $\begin{cases} y'' + \lambda y = 0, \\ y(0) = 0, \\ y(\pi) = 0. \end{cases}$

a. Show that if $\lambda = 0$, the only solution is $y = 0$.

b. Show that if $\lambda < 0$, the only solution is $y = 0$.

c. Suppose $\lambda > 0$. What values of λ give a nonzero solution for y?

2. Solve $x^2y'' - 3xy' + 4y = 1$ if one solution to $x^2y'' - 3xy' + 4y = 0$ is x^2.

3. Solve $y^{(4)} + y^{(2)} - 2y = 0$.