King Fahd Univ. of Petroleum and Minerals  
Faculty of Sciences  
Department of Mathematics and Statistics

QUIZ No. 3  
(MATH. 301-092 Section 4)

Name:
ID:

Prob. 1
Consider the Sturm-Liouville problem

\[ \frac{d}{dx} \left[ (1 + x^2)y' \right] + \frac{\lambda}{1 + x^2} y = 0, \quad y(0) = 0, \quad y(1) = 0 \]

(a) find the eigenvalues and eigenfunctions of the boundary value problem
(b) give an orthogonality relation