

M-316 QUIZ #1

Name _____

1. Classify the following Partial Differential Equation as hyperbolic, elliptic or parabolic:

$$xyu_{xx} - u_{yy} = 0$$

- a. Show that the set $\{x^2 - \frac{1}{3}, x^3 - \frac{3}{5}x\}$ is orthogonal, $-1 \leq x \leq 1$.

- b. Is the set in (a) orthonormal? If not normalize it.

2. Find the eigenvalues and eigenfunctions for the Sturm-Liouville Problem

$$y'' + \lambda y = 0, \quad y(0) = y(1) = 0$$