King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 260
Class Test III, Semester II, 2010-2011

Name:_____

ID:_____ Section:_____ Serial:_____

1. If v_1, v_2, and v_3 are linearly independent, use the definition of linear independence to prove that v_1, $v_1 + v_2$, and $v_1 + v_2 + v_3$ are linearly independent.

2. Let V be the vector space of all functions f from $\mathbb{R}$ to $\mathbb{R}$ with the usual definitions of addition and scalar multiplication.

$$(f+g)(x) = f(x) + g(x)$$
$$(cf)(x) = cf(x)$$

Let W be the set of all even functions in V . Prove that W is a subspace of V.

3. Show that $\begin{bmatrix} 1 \\ 3 \\ -1 \end{bmatrix}, \begin{bmatrix} 0 \\ -1 \\ 2 \end{bmatrix}, \begin{bmatrix} 2 \\ 1 \\ 3 \end{bmatrix}$ form a basis for $\mathbb{R}^3$.

4. Find the general solution of the DE $y^{(4)} + y'' = 0$.