

**Math 112**  
**Introduction to Riemannian Geometry**  
**Spring 2006**  
**Assignment 3**  
**Due April 27, 2006**

1. Let  $M$  be a smooth manifold and let  $X$  be a smooth vector field on a neighborhood  $W$  of  $p \in M$ . Suppose that  $X_p \neq 0$ , does there exist a coordinate chart  $(U, \phi)$  containing  $p$  such that  $E_1 = X$  on  $U$ ?

Chp. 3 (do Carmo): 1, 2, 3, 5, 6, 7, 8, 11 & 13