

Math 221  
Class Exercises: Mar. 21

Let  $U = \left\{ \begin{bmatrix} x & y & z \end{bmatrix}^T : x + 3z = 0 \right\}$

1. Find a basis for  $U$ .
2. Find an orthonormal basis for  $U$ .
3. Find a basis for  $U^\perp$ .
4. Find  $\text{Proj}_U(v)$  where

$$v = \begin{bmatrix} 1 \\ 1 \\ -1 \end{bmatrix}$$