

# Math 132 - HW 15

1. Consider  $\mathbb{C}^3$  with the standard Euclidean inner product.
  - (a) Find an orthonormal basis for the subspace  $U := \{(x, y, z) \in \mathbb{C}^3 \mid 2x + y - z = 0\}$ .
  - (b) Find the vector in  $U$  closest to the vector  $(3, 0, 0)$ .
2. Let  $W$  be a subspace of a finite-dimensional inner product space  $V$  and let  $T$  be a linear operator on  $V$ . Prove that if  $W$  is  $T$ -invariant then  $W^\perp$  is invariant  $T^*$ .