

### 0.0.1 Q5

If  $ND = DN$ , then in general, there's a basis where  $D$  is diagonal and  $N$  is in block matrix form, because if there wasn't, they don't commute in general. Then,  $N + D$  is also in block matrix form. However,  $T = N + D$ , and block-matrix form for  $T$  is unique.  $N$  in block matrix form must have 0s on the diagonal, and  $D$  must have 0s everywhere else, so the block matrix form of  $D$  and  $N$  must be uniquely determined by  $T$ , as desired.