

PF () IF AV=) V WITH V+3 THEN λ || 4 || 2 = λ < τ | 4 > = < τ | λ τ > = < τ | Α τ > = A*1/3= = <A7/3> = <\T / 10 = -\T / 10 = -\ So (1-1) 117112 =0

Since 7+0, k=T. So ker

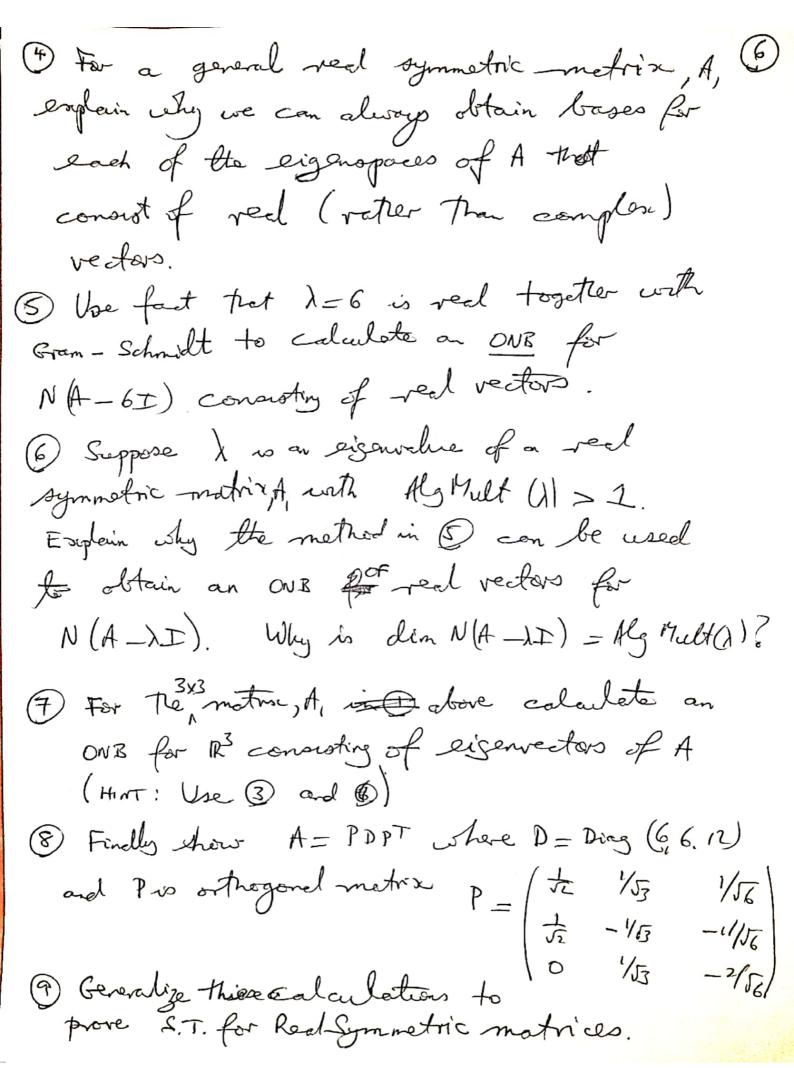
2) SIHILAR. YOU DO IT!

SPECTRAL THH FOR ROAL SYMMETRIC MATRICES

Lot $A \in \mathbb{R}^{n \times n}$, $A^T = A$ Then $A = PDP^T$ where D is diagonal and P is orthogonal.

THIS PROPLEM SHOWS YOU HOW TO OBTAIN S.T. FOR SYMMETRE MATRICES FROM S.T. FOR NORMA MATRICES

- (1) SHOV P(X) = let (1-12) = (1-6)2 (1-12)
- 3 Use the S.T. for Normal Matrices to explain why dim N(A-6I) = 2 must hold.
- 3) Now colculate bases for N(A-6I), N(A-12I) and verify That N(A-6I) I NA-RI) holds.



2ND DERVATIVE TEST (CALCULUS 3)
Let f: R2 -> R, Z = f(3). Suppose 50 s a Critical point off, ie Pf (3) = 0. Let $\Delta = det(H)$ where $H = \left| f_{xx} f_{xy} \right|_{\overrightarrow{x} = \overrightarrow{x}_0} H_{\overline{x} x} \int_{\overline{x}_0} H$ Then

A fra (\$\frac{1}{2}_0\$)

+ CLASSIFICATION LOCAL MIN LOCAL MAX SAPOLUE POINT IF By Taylor's series マ=十(ま)と十(ま)+ヤ(ま)。なーまり+は一まずり(マーマ) Let === = f(\$1), \$2 = = - \$0. Since of (3)=0 we just need to classify. Q(50) = 50 H F at \$=0. Since this real symmetric, H= PDP where can chose det(P) = +1. So Peffects a retation, $P = \begin{pmatrix} cos O - Sin O \\ Sin O & cos O \end{pmatrix}$ for some O Since rotating courds does not change nature of CPT we can look at Q(g) := Q(PTg) = Q(\overline{\pi}) = \overline{\pi}

