

ASSIGNMENT # 2

DUE: Tuesday, Jan. 30

READ: Appendix-Linear Algebra & Chapter 3 (sects. 1-3)

PROBLEMS :

Appendix: A2, A4, A8, A18, A25.

Chapter 3: 3.2, 3.5, 3.6.

Hints/solutions:

A2: Easy. c) no d) yes e) no.

A4: Just follow the procedure... last ortho-normalized vector is

$$\frac{1}{2\sqrt{35}} \left[(1-7i)\hat{i} + (5)\hat{j} + (-8+i)\hat{k} \right]$$

$$\text{A8: ... g) 3 h) Inverse of B is: } \frac{1}{3} \begin{pmatrix} 2 & -3i & i \\ 0 & 3 & 0 \\ -i & -6 & 2 \end{pmatrix} \dots$$

A18: real eigenvalues only for $\theta = 0, \pi \dots$

A25: b) eigenvalues 2, -1 ...

3.2: a) for $v > -1/2$

3.5: a) $x, -i, -d/dx$ b) it's the lowering operator.

3.6 It's hermitian. Eigenfunctions: $Ae^{\pm\sqrt{q}\phi}$ Eigenvalues: $q = -n^2$ ($n=0,1,2,\dots$)