5

$$A = \begin{bmatrix} 1 & 4 & 5 \\ 4 & -3 & 0 \\ 5 & 0 & 7 \end{bmatrix}$$

a) USE PWR METHOD W/ INITIAL VECTOR,

$$\frac{1}{\sqrt{3}}\begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} = v^{(0)}$$

& A CONVERGENCE TOLERANCE OF 5×10^{-5}

TO ESTIMATE DOMINANT EIGENVEC. & ASSOCIATED EIGVAL

$k = 1$

$$w = A v^{(0)}$$

$$= \frac{1}{\sqrt{3}}\begin{bmatrix} 1 & 4 & 5 \\ 4 & -3 & 0 \\ 5 & 0 & 7 \end{bmatrix}\begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} = \frac{1}{\sqrt{3}}\begin{bmatrix} 10 \\ 1 \\ 12 \end{bmatrix}$$

$$v^{(1)} = \frac{w}{\|w\|_2} \; ; \; \|w\|_2 = \sqrt{\left(10/\sqrt{3}\right)^2 + \left(1/\sqrt{3}\right)^2 + \left(12/\sqrt{3}\right)^2} \approx 9.0370$$

$$\approx \frac{1}{9.0370 \cdot \sqrt{3}}\begin{bmatrix} 10 \\ 1 \\ 12 \end{bmatrix}$$

$$\approx 6.3889 \times 10^{-2}\begin{bmatrix} 10 \\ 1 \\ 12 \end{bmatrix}$$

$$\approx \begin{bmatrix} 6.3889 \times 10^{-1} \\ 6.3889 \times 10^{-2} \\ 7.6665 \times 10^{-1} \end{bmatrix}$$

! VERIFY FINAL ART.

! CHECK LATEST TIME I SUBMIT HWS