C22 (CHECK) WITHOUT USING A CALCULATOR, FIND THE EIGENVALUES OF MATRIX B.

$$B = \begin{bmatrix} 2 & -1 \\ 1 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 2 & -1 \\ 1 & 1 \end{bmatrix} - \begin{bmatrix} \lambda & 0 \\ 0 & \lambda \end{bmatrix} = \begin{bmatrix} 2-\lambda & -1 \\ 1 & 1-\lambda \end{bmatrix}$$

$$\det \begin{pmatrix} 2-\lambda & -1 \\ 1 & 1-\lambda \end{pmatrix} = (2-\lambda)(1-\lambda) - (-1)(1)$$

$$\lambda^2 - \lambda - 2\lambda + 2 + 1$$

$$\boxed{\lambda^2 - 3\lambda + 3}$$ ← CHARACTERISTIC POLYNOMIAL

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{3 \pm \sqrt{-3^2 - 4(1)(3)}}{2(1)}$$

$$x = \frac{3 \pm \sqrt{-3}}{2}$$

$$\boxed{\lambda_1 = \frac{3 - \sqrt{3i}}{2}} \qquad \boxed{\lambda_2 = \frac{3 + \sqrt{3\lambda}}{2}}$$