① Order the eigenvalues to match the diagonal entries:

$$\lambda_1 = -7, \quad \lambda_2 = -2, \quad \lambda_3 = 3$$

② Form M from the corresponding eigenvectors in that same order.

If v_i is an eigenvector for λ_i, then

$$M = [v_1 \quad v_2 \quad v_3].$$

From the problem statement:

$$v_1 = \begin{pmatrix} 1 \\ -2 \\ 2 \end{pmatrix}, \quad v_2 = \begin{pmatrix} 2 \\ 1 \\ -1 \end{pmatrix}$$

$$v_3 = \begin{pmatrix} 1 \\ 2 \\ 7 \end{pmatrix}$$

Answer:

$$M = \begin{pmatrix} 1 & 2 & 1 \\ -2 & 1 & 2 \\ 2 & -1 & 7 \end{pmatrix}$$