5.5.4

EE25BTECH11047 - RAVULA SHASHANK REDDY

October 2, 2025

Question:

Find the value of k for which the matrix is singular.

$$\begin{pmatrix} k & 8 \\ 1 & 2k \end{pmatrix}$$

Solution:

Singular matrix:

$$\det\begin{pmatrix} k & 8 \\ 1 & 2k \end{pmatrix} = 0 \tag{1}$$

$$k \cdot 2k - 1 \cdot 8 = 0 \tag{2}$$

$$2k^2 - 8 = 0 \tag{3}$$

$$2k^2 = 8 \tag{4}$$

$$k^2 = 4 \tag{5}$$

$$\boxed{k = \pm 2} \tag{6}$$