

# DATA 605 - Discussion 2

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Page 354, problem M11

Find a value of  $k$  so that the matrix  $A = \begin{bmatrix} 1 & 2 & 1 \\ 2 & 0 & 1 \\ 2 & 3 & k \end{bmatrix}$  has  $\det(A) = 0$ , or explain why it is not possible.

Using the formula for a  $3 \times 3$  matrix, we need  $k$  such that  $1 \begin{bmatrix} 0 & 1 \\ 3 & k \end{bmatrix} - 2 \begin{bmatrix} 2 & 1 \\ 2 & k \end{bmatrix} + 1 \begin{bmatrix} 2 & 0 \\ 2 & 3 \end{bmatrix} = 0$ .

After multiplying this out, we're left with  $-2[2k - 2] = -3$ .

Distribute the lhs:  $-4k + 4 = -3 \rightarrow 7 - 4k = 0$ .

Solving for  $k$ , we find the solution  $k = \frac{7}{4}$ .