Math 4133 - Linear Algebra

Quiz #5 - 2011.02.16

Solutions

Compute the determinant of the following matrix:

$$\begin{bmatrix} 2 & -1 & 4 \\ 4 & 0 & -1 \\ 2 & 6 & 2 \end{bmatrix}$$

We can expand along any row or column, but let's chose the second row:

$$\begin{aligned} \det\left(\begin{bmatrix} 2 & -1 & 4 \\ 4 & 0 & -1 \\ 2 & 6 & 2 \end{bmatrix}\right) &= -4 \cdot \det\left(\begin{bmatrix} -1 & 4 \\ 6 & 2 \end{bmatrix}\right) + 0 \cdot \det\left(\begin{bmatrix} 2 & 4 \\ 2 & 2 \end{bmatrix}\right) - (-1) \cdot \det\left(\begin{bmatrix} 2 & -1 \\ 2 & 6 \end{bmatrix}\right) \\ &= -4(-2-24) + 1(12+2) \\ &= 104 + 14 \\ &= 118 \end{aligned}$$