

Find the determinant of the matrix

$$M = \begin{bmatrix} 3 & 0 & 0 & -3 \\ -3 & 0 & -1 & 0 \\ 0 & 1 & 0 & 1 \\ 0 & -2 & -2 & 0 \end{bmatrix}.$$

$$\det(M) = \boxed{\phantom{000}}$$

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$$M = \begin{bmatrix} 3 & 0 & 0 & -3 \\ -3 & 0 & -1 & 0 \\ 0 & 1 & 0 & 1 \\ 0 & -2 & -2 & 0 \end{bmatrix}.$$

$$\det(M) = \boxed{24}$$