

Peter Cholak Math 221 Monday, September 16

For the entire quiz, we will consider the matrix $A = \begin{bmatrix} 1 & 0 & 3 \\ 0 & 3 & 0 \\ 0 & 3 & 1 \end{bmatrix}$. It is to your advantage to read all of the questions first before beginning work. Is A invertible?

If so, find the inverse.

Solve the equation $A\mathbf{x} = \mathbf{b}$ for \mathbf{x} , where $\mathbf{x} = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$ and $\mathbf{b} = \begin{bmatrix} 2 \\ -5 \\ 0 \end{bmatrix}$.

Turn over; more problems on the reverse!

Form the new matrix $C = \left[A \mid \begin{array}{c} 2 \\ -5 \\ 0 \end{array} \right] = \left[\begin{array}{ccc|c} 1 & 0 & 3 & 2 \\ 0 & 3 & 0 & -5 \\ 0 & 3 & 1 & 0 \end{array} \right]$.

Compute $A^{-1}C$.

Solve the equation $C\mathbf{y} = \mathbf{0}$ for \mathbf{y} , where $\mathbf{y} = \begin{bmatrix} x \\ y \\ z \\ w \end{bmatrix}$. Be sure to give the *general solution* to the system of equations.