Name Solution Key

UNIVERSITY OF WYOMING — Math 2250—Fall 2023 — Department of Mathematics

Elementary Linear Algebra

Quiz 3

Friday, September 22, 2023

Consider the linear system $\begin{cases} 3x_1 + 6x_2 = 24 \\ x_1 + 2x_2 = 8 \end{cases}$. Write down the matrix A and the column vectors $\mathbf{x}$ and $\mathbf{b}$ for which this system is expressible in the form $A\mathbf{x} = \mathbf{b}$:

$$A = \begin{bmatrix} 3 & 6 \\ 1 & 2 \end{bmatrix}; \qquad \mathbf{x} = \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}; \qquad \mathbf{b} = \begin{bmatrix} 24 \\ 8 \end{bmatrix}.$$

State a *particular solution* of the linear system above, expressed as a column vector. (You do not need to show any work as this can easily be found by inspection.)

$$\mathbf{x} = \begin{bmatrix} 8 \\ 0 \end{bmatrix}$$

State the *general solution* of the linear system above, expressed as a column vector. (Again, show as much or as little work as you need; the answer can easily be seen by inspection.)

$$\mathbf{x} = \begin{bmatrix} 8 \\ 0 \end{bmatrix} + t\begin{bmatrix} 2 \\ -1 \end{bmatrix} = \begin{bmatrix} 8+2t \\ -t \end{bmatrix} \text{ where } t \text{ is arbitrary.}$$