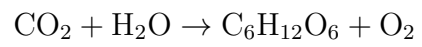


Math 251 X02
Test Two

Time: 50 minutes
Total: 25 marks

Name: _____

1. [4 marks] We want to balance:



Set up a system of equations. DO NOT SOLVE THE SYSTEM.

2. [4 marks] A is an invertible matrix. Solve for X :

$$(AX + 3I)^T = B$$

3. [1 mark] The set of vectors $\{\mathbf{x}, \mathbf{y}\}$ is linearly dependent. Is the set of vectors $\{\mathbf{x}, \mathbf{y}, \mathbf{z}\}$ linearly dependent? Explain briefly.

4. [4 marks] Given $A = \begin{bmatrix} -2 & 3 \\ 8 & 5 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -5 \\ 5 & 1 \end{bmatrix}$, and $C = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$.
Find $(A - 4B)^T C^2$.

5. [6 marks] Solve the system by finding A^{-1} .

$$\begin{aligned}x - 2y - 3z &= 16 \\4x - 7y - 16z &= 45 \\-3x + 6y + 10z &= -45\end{aligned}$$

6. [6 marks] Find k so that $\mathbf{w} = \begin{bmatrix} 21 \\ -22 \\ k \end{bmatrix}$ is in $\text{span}\left(\begin{bmatrix} 1 \\ 3 \\ 4 \end{bmatrix}, \begin{bmatrix} 3 \\ -8 \\ 3 \end{bmatrix}\right)$.