

Answer to GREEN Exam

1. **B**

2. **A**

3. **E**

4. **D**

5. **C**

6. **C**

7. **B**

8. (1) $T\left(\begin{bmatrix} 1 \\ 0 \end{bmatrix}\right) = \begin{bmatrix} 2 \\ 3 \end{bmatrix}$ $T\left(\begin{bmatrix} 0 \\ 1 \end{bmatrix}\right) = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$

(2) $A = \begin{bmatrix} 2 & 1 \\ 3 & 1 \end{bmatrix}$ $A^{-1} = \begin{bmatrix} -1 & 1 \\ 3 & -2 \end{bmatrix}$

(3) $\mathbf{x} = \begin{bmatrix} 2 \\ 3 \end{bmatrix}$

9. (1) *Correct Answer is:* $\begin{bmatrix} 1 & 0 & -1 & 1 \\ 0 & 1 & h & 2 \\ 0 & 0 & h^2 - 2h - 3 & h - 3 \end{bmatrix}$ (*Answer may vary*)

(2) $h = 3$

(3) $h = -1$

(4) h is not 3 or -1

10. (1) The REDUCED row echelon form for the matrix A is $\begin{bmatrix} 1 & 0 & 0 & 0 & 5 \\ 0 & 0 & 1 & 0 & 3 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$

(2) A basis for the null space of A is $\left\{ \begin{bmatrix} 1 \\ 1 \\ 2 \\ 3 \end{bmatrix}, \begin{bmatrix} 2 \\ 5 \\ 4 \\ 2 \end{bmatrix}, \begin{bmatrix} 4 \\ 13 \\ 12 \\ 0 \end{bmatrix} \right\}$. Answer may vary!

(3) A basis for the null space of A is $\left\{ \begin{bmatrix} 0 \\ 1 \\ 0 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} -5 \\ 0 \\ -3 \\ 0 \\ 1 \end{bmatrix} \right\}$. Answer may vary!