

Answer Key to GREEN Exam

1. **C**

2. **D**

3. **A**

4. **B**

5. **A**

6. **E**

7. **C**

8. (1) The REDUCED row echelon form for the matrix A is $\begin{bmatrix} 1 & 3 & 0 & 3 & 6 \\ 0 & 0 & 1 & 2 & 3 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$.

(2) $\text{rank}A = 2$.

(3) A basis for the null space of A is $\left\{ \begin{bmatrix} -3 \\ 1 \\ 0 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} -3 \\ 0 \\ -2 \\ 1 \\ 0 \end{bmatrix}, \begin{bmatrix} -6 \\ 0 \\ -3 \\ 0 \\ 1 \end{bmatrix} \right\}$. Answer may vary!

9. (1) The determinant of A is -3 .

(2) $b_{23} = -1$.

10. (1) $T\left(\begin{bmatrix} 1 \\ 0 \end{bmatrix}\right) = \begin{bmatrix} 1 \\ 2 \\ -1 \end{bmatrix}$ and $T\left(\begin{bmatrix} 0 \\ 1 \end{bmatrix}\right) = \begin{bmatrix} -1 \\ 0 \\ 5 \end{bmatrix}$.

(2) $A = \begin{bmatrix} 1 & -1 \\ 2 & 0 \\ -1 & 5 \end{bmatrix}$.

(3) $h = -18$.