

**Directions:** Please answer in the space provided. No calculators. Please put all phones, etc., away.

---

The following questions concern the matrix  $A = \begin{bmatrix} 1 & 3 & -2 & 4 \\ -2 & -6 & 4 & -8 \\ 1 & 3 & -1 & 2 \end{bmatrix}$ .

1. Find a basis for the column space of  $A$ .

2. Find a basis for the row space of  $A$ .

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

4.  $\text{nullity}(A) =$