Instructions: You must show all work to receive full credit for the problems below. You may check your work with a calculator, but answers without work will receive minimal credit. Use exact answers unless the problem starts with decimals or you are specifically asked to round.

1. Consider the system of equations $\begin{cases} x_2 + 2x_3 = 5 \\ x_1 + 2x_2 + 3x_3 = 8 \\ 2x_1 \quad\;\; + 6x_3 = 11 \end{cases}$.

    a. Write the system of equations as an augmented matrix. State the size of the matrix.
    b. Use row operations to reduce the matrix to echelon form. Explain in your own words why this form of the matrix is not unique. Be sure to indicate at each step the row operations performed.
    c. Continue reducing the matrix to reduced echelon form. Explain in your own words why this solution is unique.
    d. Is the solution consistent or inconsistent?
    e. If applicable, is the solution independent or dependent? If it does not apply, explain why not.
    f. If the solution is independent, state the solution as an ordered pair and in column vector form. If the solution is dependent, state the solution in parametric form.
    g. Write the system of equations as a vector equation.
    h. Write the system of equation as a matrix equation.