Name: _____

Directions: Show all work. No credit for answers without work.

1. **[3 points]** Find the general solution of the system with the following augmented matrix.

$$\begin{bmatrix} 2 & 4 & -1 & 1 & 13 \\ -1 & -2 & 3 & -1 & -14 \\ 3 & 6 & 1 & 0 & 7 \end{bmatrix}$$

2. **[2 points]** Are the two matrices given below row equivalent? Explain why or why not.

$$A = \begin{bmatrix} 1 & 2 \\ 2 & 4 \end{bmatrix} \qquad B = \begin{bmatrix} 1 & 3 \\ 2 & 6 \end{bmatrix}$$

3. **[3 points]** Find a quadratic polynomial $f(t) = a + bt + ct^2$ such that $f(-1) = 9$, $f(1) = 5$, and $f'(-1) = -4$.

4. **[2 parts, 1 point each]** Pivot columns and number of solutions.

   (a) Suppose that every column in the *augmented* matrix of a linear system contains a pivot position. What can you conclude about the number of solutions to the system? Explain.

   (b) Suppose that every column in the *coefficient* matrix of a linear system contains a pivot position. What can you conclude about the number of solutions to the system? Explain.