

**Directions:** Show **ALL** work for credit; Give **EXACT** answers when possible; **SIMPLIFY** your answers;

1. Row reduce the matrix  $A$  to reduced row echelon form (7 points). and use your matrix to answer the True False questions below. For each true false question give a short reason for your answer.

$$A = \begin{bmatrix} 1 & 2 & 0 & 1 & 3 \\ 3 & 4 & 2 & 3 & 3 \\ 1 & 3 & -1 & 0 & 1 \end{bmatrix}$$

True or False and a short reason for your choice (1 point each)

- (a) The matrix  $B$ , given by first three columns of  $A$ , is invertible
- (b) The vector equation  $A^T X = 0$  has infinitely many solutions
- (c) The row vectors of  $A$  form an independent set.