

Name (Last, First): _____

Student ID: _____

1. Assume the following assertions are true:

There are courses at Berkeley.

In every Berkeley course, there is a student who understands everything.

Circle each of the following assertions which must also then be true:

- a. *There is a Berkeley course in which all students understand something.*
- b. *There is a Berkeley course in which all students understand nothing.*
- c. *There is no Berkeley course in which each student understands nothing.*
- d. *There is no Berkeley course in which each student does not understand something.*
- e. *There is a Berkeley course in which there is a student who understands everything.*

2. For what numbers a, b, c is the following matrix in row echelon form (REF) or reduced row echelon form (RREF)?

$$\begin{bmatrix} 0 & a & 1 & b & 0 \\ 0 & 0 & 0 & c & 0 \\ 0 & 0 & 0 & 0 & a \end{bmatrix}$$

REF:

RREF: