Chapter08 Solving system of linear equations

1. Equivalent
   a) Two system of linear equations are equivalent if they have exactly the same solution set
   b) Interchange, Scaling and Row Addition will produce an equivalent one
2. Augmented matrix
   a) [A | b] : m*(n+1)
3. Elementary row operations:
   a) Interchange any two rows of the matrix
   b) Multiply every entry of some row by the same non-zero scalar
   c) Add a multiple of one row of the matrix to another row
4. Reduced Row Echelon Form
   a) A system of linear equations is easily solvable if its augmented matrix is in RREF
   b) Row Echelon Form
      Each nonzero row lies above every zero row
      The leading entries are in echelon form
   c) RREF
      The matrix is in REF
      The columns containing the leading entries are standard vectors
   d) A matrix can be transformed into many REFs by row operation, but only one RREF
5. Solutions
   a) Unique solution
      If RREF looks like [*I* b'], it has unique solution
   b) Infinite solutions
      With free variables, there are infinitely many solutions
   c) No solution
      When an augmented matrix contains a row in which the only nonzero entry lies in the last column
   d) Gaussian elimination
      An algorithm for finding the RREF of a matrix