Systems of Equations (6.1, 6.3, 6.4)

- Solve small (two equations) systems of linear equations algebraically.
- Solve small (two equations) systems of nonlinear equations by substitution.
- Understand that a system of linear equations may have one solution, no solution, or infinitely many solutions.
- Understand the difference between a consistent and an inconsistent system.
- Understand the difference between an independent and a dependent system.
- Explain, in detail, the steps of Gaussian elimination with back-substitution.
- Given an application problem, write a system of linear equations for the problem.
- Given a linear system, write the augmented matrix.
- Given an augmented matrix, write the associated linear system.
- Solve an upper-triangular system by using back-substitution.
- Recognize when a matrix corresponds to an inconsistent system.
  Know that such a system has no solution.
- Recognize when a matrix corresponds to a dependent system. Know that such a system has infinitely many solutions. Be able to find three different solutions.

Matrix Arithmetic and Algebra (6.5, 6.6)

- Given a matrix, tell how many rows and how many columns it has.
- Know when matrix addition is defined.
- Know when matrix multiplication is defined.
- Understand that matrix multiplication is “row-by-column”.
- Be able to add or multiply two matrices when it is defined.
- Know what an identity matrix looks like.
- Know that the product of a matrix and its inverse is an identity matrix.
- Given a system of linear equations, write the associated matrix equation.
- Given a matrix equation, write the associated system of linear equations.
- Given a matrix equation, solve it (by multiplying both sides of the equation by an inverse matrix).

Things you do not need to know:

(6.2) systems of inequalities; linear programming [You do need to know systems of equations.]
(6.3) systems of equations in three or more variables using any method other than Gaussian elimination.
(6.4) the book’s notation for row operations [You do need to know the notation we used in class.]
(6.4) reduced row-echelon form [You do need to know row-echelon form.]
(6.5) matrix subtraction, scalar multiples [You do need to know matrix addition and multiplication.]