UNIT 10: Systems of Equations and Inequalities

Objectives: Upon completion of the unit, students will be able to:

- Solve a system using the graphing, substitution and elimination method
- Determine if a system is dependent, independent or inconsistent
- Set up and solve an application using a system
- Solve a system involving two or three variables, including writing the variables in terms of a parameter
- Find an augmented matrix to represent a system of equations
- Solve a system using RREF or REF, and using matrices
- Perform matrix operations algebraically and on graphing calculator
- Find determinant of a matrix, and find the inverse of a matrix
- Set up and solve a partial fraction decomposition problem
- Solve a non-linear system

Video Lectures	Video Examples	Section from Text (WebAssign)
1a. Solving a linear system by graphing 1b. Solving a linear system by substitution 1c. Solve a linear system by elimination 1d. Applications for linear systems	1a. Solve a linear system by graphing (infinite solutions) 1b. Solve a linear system using substitution 1c. Solve a linear system using substitution (no solution) 1d. Solve a system using elimination 1e. Application – coin problem example 1f. Application – plane and wind problem example 1g. Application – investment problem 1h. Application – corral perimeter	10.1
2a. Solve system in three variables (part I) 2b. Solve system in three variables (part II)	2a. Solving a system in three variables (patrickjmt) 2b. Solving inconsistent system (patrickjmt) 2c. Solve dependent system (patrickjmt)	10.2
3a. Augmented Matrices on calculator (both REF and RREF) 3b. Row Echelon Form (REF) 3c. Reduced Row Echelon Form (RREF)	3a. Solve a system using RREF algebraically 3b. Reduced Row Echelon Form (part I and part II) - Patrickjmt	10.3
4a. Matrix Operations 4b. Multiplying Matrices 4c. Great multiplying matrices animation	4a. Matrix Operations 4b. Matrix multiplication on the graphing calculator	10.4
5a. The Identity Matrix 5b. Find inverse matrix using graphing calculator 5c. Find the inverse matrix algebraically (using augmented matrix) 5d. Explanation of solving using matrix equations (why A inverse B works)	5a. Determine inverse matrices using augmented matrices	10.5

6a. Find the determinant of a matrix (diagonal method) 6b. Find the determinant using the graphing calculator 6c. Find the inverse of a matrix using determinants and cofactors – patrickjmt	6a. Find the determinant of the matrix using cofactors 6b. Find the inverse of a matrix using determinants and cofactors – patrickjmt	10.6
7a. Set up partial fraction decomposition 7b. Find partial fraction decomposition (linear factors) 7c. Find partial fraction decomposition - patrickjmt	7a. Find partial fraction decomposition (repeated linear factors) 7b. Find partial fraction decomposition (repeated linear factors again) 7c. Find partial fraction decomposition (linear and quadratic factors) 7d. Find partial fraction decomposition (repeated quadratic factors)	10.7
8a. Solve a system of non-linear equations (substitution) 8b. Solve a system of non-linear equations using elimination	8a. Solve a system of non-linear equations using substitution	10.8