Test 1: Problems 1 – 4
Test 2: Problems 5 – 8
Test 3: Problems 9 – 12
Test 4: Problems 13 – 15

1 Using Functions

- Given an input to a function, determine the corresponding output. (Example 1.2.1b, Example 1.2.3b, Example 1.2.4c)
- Given the output of a function, determine the corresponding input. (Example 1.2.2, Example 1.2.7b)
- Determine the point where two functions are in equilibrium. (Example 1.2.2, Example 1.2.4a)

2 Linear Functions

- Justify the use of a linear function to model a given scenario. (Example 1.3.1, Example 1.2.6)
- Construct a linear function to model a given scenario. (Example 1.2.3, Example 1.2.4, Example 1.2.5)

3 Systems of Linear Equations

- Solve a system of three equations in three unknowns using matrix inversion. You may use a calculator to perform the inversion. The system will have a unique solution. (Example 4.3.4)
- Construct a system of equations to model a scenario. (Example 3.3.1, Example 3.3.2, Example 3.3.4)

4 Matrix Algebra

- Use matrix addition, subtraction, and scalar multiplication to work with data. (Example 4.1.2, Example 4.1.3)
- Use matrix multiplication to work with data. (Example 4.2.1, Example 4.2.5)

5 Game Theory

- Reduce a game by dominance. (Discussion prior to Example 4.4.3)
- Solve a 2×2 game according to the minimax criterion. (Example 4.4.3)

6 Input-Output Models

- Given an input-output table, determine the level of production required to meet the specified demand. (Section 4.5 Exercise 19)

7 Linear Programming

- Solve a two-variable linear program by hand. (Example 5.2.1, Example 5.2.4)
- Set up, but do not solve, a larger linear program. (Section 5.4 Exercise 25)

8 Sets

- Describe the elements of sets constructed through various operations. (Section 6.2 Exercise 35)
- Determine the number of elements of sets constructed through various operations. (Example 6.2.1, 6.2.2, 6.2.5)

9 Counting

This question will contain two counting problems that could make use of any of the following ideas. Computing the number of ways to get a certain poker hand (Example 6.4.8) is a good example of the ways in which these ideas can be combined.

- Adding alternatives and multiplying steps (Example 6.3.1)
- Permutations (Example 6.4.2)
- Combinations with no order at all (Example 6.4.7)
- Combinations with some order involved (Exercise 6.4.47)

10 Unconditional Probability

This question will contain two probability computations that could make use of any of the following ideas.

- Probability of an event. (Example 7.3.1)
- Probability of an intersection. (Example 7.3.6)
- Probability of a union. (Example 7.3.4)
- Probability of a complement. (Example 7.3.5)
- Determine whether two events are independent. (Exercise 7.5.31)

11 Conditional Probability and Bayes' Theorem

- Compute a conditional probability given descriptions of the events. (Example 7.5.1)
- Compute a conditional probability using Bayes' Theorem. (Example 7.6.1)

12 Markov Systems

- Given information about the initial distribution and transition probabilities, compute the distribution at some time in the future. (Example 7.7.1)
- Set up (but do not solve) a system of equations that would compute the steady state vector for a two-state Markov system. (Example 7.7.4)

13 Probability Distributions

- Construct the probability distribution for a non-binomial finite random variable by constructing the related sample space. (Exercise 8.1.25)
- Construct the probability distribution for a binomial random variable using the formula. (Example 8.2.2)

14 Expected Value and Variance

- Compute the expected value of a non-binomial random variable (Example 8.3.3) or a binomial random variable (Example 8.3.5).
- Compute the variance of non-binomial random varible (Example 8.4.3) or a binomial random variable (Example 8.4.5a).

15 Normal Distribution

- Use a table to compute a portion of the area under a normal curve (Example 8.5.1, Example 8.5.2) or a binomial "curve" (Example 8.5.4a).
- Use a table to compute an interval around the mean that encompasses a specified percentage of outcomes. (Example 8.5.3b)