Concepts to know Final Exam

- Lines
  - Intercepts
  - Point Slope Formula
  - Finding equations of lines
  - Graphing
  - Linear Modeling

- Cost, Revenue, and Profit Equations

- Break even Values

- quadratic functions
  - vertex
  - open up/down
  - maximum/minimum
  - revenue function from the demand function

- Solving systems of equations
  - Substitution method
  - Subtraction/addition method
  - Gauss-Jordan Method
  - rref
  - Matrices
  - Different types of answers
    - No solution
    - Exactly one solution
    - Infinite solutions.
      - Written in parametric form.
      - Placing restriction on the parameter.

- Row reduced form

- Matrix Operations
  - Addition
  - Subtraction
  - Multiplication
  - Equality
  - Scalar multiplication
  - Transpose

- Translating word problems to systems of equations.

- Inequalities.

- Shading the feasible region.

- Bounded or unbounded feasible region.

- Setting up a Linear programming problem.
  - Be sure to define the variables.

- Inequalities
  - Graphing
  - Shading for the feasible region.
  - Manipulation

- Solving Linear programming problems.
  - Graphing method
    - feasible region
    - Corner points
    - How to find a solution.

- Simplex method
  - Setting up the initial matrix
  - Reading off the solution
  - Reading off the surplus.
  - doing the Simplex method. (pivoting)
  - Be able to explain how the simplex method work.

- Set operations.

- Subsets and Elements.

- Translating sets to English.

- Translating English to sets.

- Filling in a Venn Diagram

- Shading Venn diagrams

- Counting
  - Venn Diagrams
  - Tables
  - Trees
  - Multiplication Principle
  - Combinations
  - Permutations
  - Counting what you want by counting what you don’t want
  - Formulas.
• Probability
  – Sample space
  – Events
  – Outcomes
  – Equally likely (uniform sample space)
  – Mutually exclusive
  – Probability formulas section 7.3
  – Venn diagrams
  – Trees
  – tables

• All problems like those on the handouts

• Conditional probability
  – Reduced sample space
  – Formula
  – Backwards tree

• Independent Events
  – Test for independence: Two events, A and B, are independent if \( P(A \cap B) = P(A)P(B) \)
  – Using the concept of independence

• Random variables
  – Finite Discrete
  – Infinite Discrete
  – Continuous
  – Probability distribution

• Histogram

• Mean, Median, Mode, Variance, Standard Deviation

• Expected Value

• Fair game

• Odds
  – in favor of E
  – against E

• Probability from Odds

• Bernoulli Trials (Binomial Distribution)
  – mean, standard deviation
  – expected value

• Normal Distribution
  – conversion from X to Z.
  – The standard normal random variable.

• Calculator commands
  – binomalpdf
  – binomalcdf
  – normalcdf
  – invnorm
  – rref
  – linreg
  – 1varstats

• compound interest

• simple interest

• annuities

• equity

• amortization schedules

• effective yield or effective rate of interest

• Markov Chain information
  – transition matrix
  – distribution state(vector)
  – finding the \( n \)th distribution state given \( X_0 \)
  – regular transition matrix
  – steady state for a Markov chain

• Any additional topic discussed in class.