Linear Programming and Mixture Problems

Read the book chapters first, then make sure you can answer the questions in the notes. Following that, work on some skills-check problems and exercises. Then take the online quizzes.

Reading 4.1, 4.2, 4.3
Skills Check 1, 2, 5, 6, 7, 9, 10, 11, 13, 14, 15, 17, 18, 21, 22, 24, 25
Exercises 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 15, 16, 17, 21, 22, 24, 25, 26, 32, 34, 36, 37, 38, 39, 40, 42, 43, 46, 48
Quiz Take the quiz[1]

4.1

- What is *linear programming* in very general terms?
- What is a *mixture problem*?
- What is an *optional production policy* in a mixture problem?
- A mixture problem contains some key features: *resources*, *products*, *recipes*, *profits* and *objective*. Describe what each of these terms means, and illustrate these terms in a concrete examples.
- Come up with examples of mixture problems from your experience.
- When we translate a mixture problem into an actual mathematical problem, two key steps is the determination of *minimum constraints* and *resource constraints*. Explain what those are. What kinds of algebraic expressions do these give rise to?
- What do we refer to as the *feasible region* in a mixture problem.
- How do we draw the feasible region?

4.2

- What does the *corner point principle* say for mixture problems?
- What simple method for determining the optimal production policy does this corner point principle provide?
- What shape does the feasible region have?
- Make sure to review the section about how to solve systems of equations (page 128).
- Work out some examples of solving mixture problems via this principle.
- If a problem has two resources and 3 resource constraints on them, how many corners might the feasible region have?

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[1]

4.3

- What is the *profit line* for a particular profit value? What is its significance when compared to the feasible region?
- How does the profit line help "prove" that the corner point principle works?