Essential Skills for Chapter 7

1. §7.1 Solve linear systems.

   EG Solve: $.5x + .3y = 2.7$
   $.7x - .2y = 1.3$

2. §7.2 Use matrices to solve linear systems.

   EG Solve: $x + y - z - w = 6$
   $2x + z - 3w = 8$
   $x - y + 4w = -10$

   $3x + 5y - z - w = 20$

3. §7.6 Solve nonlinear systems.

   EG Solve: $x^2 + y^2 = 100$
   $3x - y = 10$

4. §7.7 Graph systems of linear inequalities.

   EG Graph: $x \geq 0$
   $y \geq 0$
   $x+y \geq 2$
   $x+y \leq 8$
   $2x+y \leq 10$

5. §7.8 Linear Programming

   EG A manufacturer produces two models of bicycles. The times (in hours) required for assembling, painting, and packaging each model are shown in the table.

Process	Hours, model A	Hours, model B
Assembling	2	2.5
Painting	4	1
Packaging	1	0.75

The total times available for assembling, painting, and packaging are 4000 hours, 4800 hours, and 1500 hours, respectively. The profits per unit are $45 for model A and $50 for model B. How many of each type should be produced to maximize profit? What is the maximum profit?

Essential Skills for Chapter 8

1. §8.4 Use Mathematical Induction

   EG Prove that $n < 2^n$ for all positive integers n.

Extra Practice for Chapter 8

1. Prove, using mathematical induction, the sum of the first n natural numbers is $n(n+1)/2$.

2. Prove, using mathematical induction, the sum of the first n odd natural numbers is n^2.