1. §7.1 Solve linear systems.
   EG Solve: \( 0.5x + 0.3y = 2.7 \)
   \( 0.7x - 0.2y = 1.3 \)

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.

<table>
<thead>
<tr>
<th>Process</th>
<th>Hours, model A</th>
<th>Hours, model B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assembling</td>
<td>2</td>
<td>2.5</td>
</tr>
<tr>
<td>Painting</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Packaging</td>
<td>1</td>
<td>0.75</td>
</tr>
</tbody>
</table>

   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?

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 \( n^2 \).