Today we discuss

1. the topics covered in MA 242 in general terms,
2. how this course will operate, and
3. one or two examples of applications of linear algebra.

Rough Outline of MA 242

1. Linear Equations and Transformations
   (a) row reduction
   (b) solution sets of linear equations
   (c) linear transformations
2. Matrix Algebra
   (a) matrix operations
   (b) invertible matrices
   (c) computer graphics
3. Determinants
   (a) definition and properties
   (b) geometric interpretation
4. Abstract vector spaces
   (a) vector spaces and subspaces
   (b) bases and dimension
5. Eigenvalues and eigenvectors
   (a) eigenspaces
   (b) diagonalization
6. Orthogonal sets and matrices
Linear programming example:

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Food 1</th>
<th>Food 2</th>
<th>Required Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>30 units/ounce</td>
<td>20 units/ounce</td>
<td>120 units</td>
</tr>
<tr>
<td>B</td>
<td>40 units/ounce</td>
<td>10 units/ounce</td>
<td>80 units</td>
</tr>
<tr>
<td>C</td>
<td>20 units/ounce</td>
<td>40 units/ounce</td>
<td>100 units</td>
</tr>
<tr>
<td>Cost</td>
<td>10 cents/ounce</td>
<td>15 cents/ounce</td>
<td></td>
</tr>
</tbody>
</table>