Mathematical Concepts Addressed: Solving System of Equations and Matrices

Course/Grade: Pre-calculus with Applications/Grade 12

Time Span: One Week

Technology Used: TI-83 Graphing Calculator, Internet

Daily Outline:
Day 1 – Solving Systems of Equations Graphically on TI-83 Plus
Day 2 – Solving Systems of Equations in Two Variables using Graphing, Substitution and Elimination Manually
Day 3 – Matrices Applications on the TI-83 Plus (Addition, Subtraction, Multiplication, Determinant, Inverse, and Solving)
Day 4 – Matrices Operations (Manual Methods)
Day 5 – Solving Systems of Equations (Introduction to Linear Programming) using the TI-83 Plus


The week unit incorporates the opening five lessons of Chapter 2 of the textbook. Future lessons continue with exploring matrix coordinates, transformations, inverses, graphing systems of inequalities and linear programming.
Day 1 - Lesson Plan

**Objectives:** The students will be able solve linear systems of equations graphically using the TI-83 Plus and model real-life problems and situations for their results.

**Prerequisites:** The students can manually solve systems of linear equations. The students can graph the solutions of systems of linear equations.

**Materials and Resources:**
- Standard classroom
- Overhead Projector
- TI-83 Plus Graphing Calculator
- TI View screen for TI-83 Plus Graphing Calculator
- TI-83 Plus Worksheet
- Textbook

**Performance Standard:**
- New York State: Students will use aspects of Mathematical Analysis (1); Information Systems (2); Reasoning, Number & Numerations, Operations, Modeling/Multiple Representation; Patterns/Functions and Measurement (3.1-3.5, 3.7); Technology (5.3-5.4); Interconnectedness Models (6.2); Interdisciplinary Problem solving (7).
- NCTM: Students will use aspects of Problem Solving; Communication; Reasoning; Connections; Algebra; Functions.
Opening Activity:
Purpose: To have students recall how to solve systems of linear equations manually. Provide basis for examples demonstrated on TI-83 Plus.

- Students will solve the following system of equations.
  
  \[
  \begin{align*}
  1) & \quad y = x + 4 \\
  & \quad y = x + 4 \\
  2) & \quad 2x + y + 2 = 0 \\
  & \quad x + 2y = 0 \\
  \end{align*}
  \]

Developmental Activity: (see handout)

- Students will graph the systems of equations from the Opening Activity using the TI-83 Plus following the entering format on the handout.
- Students will solve the following system of equations using the TI-83 Plus.
  
  \[
  \begin{align*}
  1) & \quad y = 2x + 6 \\
  & \quad y = 2x + 2 \\
  2) & \quad 4x + 5y + 6 = 0 \\
  & \quad 6x + 3y = 0 \\
  3) & \quad 3x + 5y = 2 \\
  & \quad x = 7y + 4 \\
  \end{align*}
  \]

Closing Activity: (see handout)

- Students will use a TI-83 Plus to solve a system of linear equations developed from a real-life situation taken from the textbook.

Assignment: page 55, # 1 – 6 all

Purpose: To reinforce the concepts presented today, provide practice using the TI-83 Plus to determine linear system results, and prepare students to apply the technology to developing and comparing results to manual methods.
STUDENT WORKSHEET

Solving Linear Equations with the TI-83 Plus:

**Entering Data:**

<table>
<thead>
<tr>
<th>Given: (1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y = x + 4 )</td>
<td>( 2x - y + 2 = 0 )</td>
</tr>
<tr>
<td>( y = \Box x + 4 )</td>
<td>( x + 2y - 4 = 0 )</td>
</tr>
</tbody>
</table>

To solve the following systems of linear equations follow these steps:

1-  Enter \([Y=]\) 1 \([X,T,\Box,n]\) + 4 \([ENTER]\) (–) \([X,T,\Box,n]\) + 4 \([GRAPH]\)
2-  If no graph appears:  \([2nd]\) \([Y=]\) 4 \([ENTER]\) this makes sure STATS PLOTS are Off
    \([ZOOM]\) 6 to fit graph on screen
3-  Enter \([2nd]\) \([CALC]\) 5 \([ENTER]\) \([ENTER]\) \([ENTER]\) will now list the intersection point of both
    linear equations (X=0, Y=4) for system (1)
4-  Repeat steps for system (2) (ans. X=0, Y=2)

Solve the following systems using the TI-83 Plus:

1) \( y = 2x + 6 \)  
2) \( 4x - 5y + 6 = 0 \)  
3) \( 3x + 5y = 2 \)

\( y = 2x + 2 \)  
\( 6x - y + 3 = 0 \)  
\( x = 7y + 4 \)

**Real Life Application:**

A specialty manufacturing company sells hand-made patio furniture. It has monthly fixed overhead expenses of $9000 and each patio set costs $250 to produce. If they must sell each set for $650 to be competitive with other manufacturers, how many units must they sell to break even each month?
Teachers Notes:

**Opening Activity:** (Solutions) Present review problems outlining the basic steps using substitution and elimination to solve a simple system of equations.

\[
\begin{align*}
1) & \quad 2x + y = 0 \\
   & \quad x + 2y = 0 \\
2) & \quad 2x + 2 = \frac{x}{2} + 2 \\
   & \quad y = 4
\end{align*}
\]

**Developmental Activity:** Guided practice on how to use the TI-83 to find system solutions using the student worksheet.

\[
\begin{align*}
1) & \quad y = 2x + 6 \\
   & \quad y = 2x + 2 \\
   & \quad x = 2 \\
   & \quad y = 2
\end{align*}
\]

\[
\begin{align*}
2) & \quad 4x + 5y + 6 = 0 \\
   & \quad 6x + y = 3 = 0 \\
   & \quad x = 1.730769 \\
   & \quad y = 7.384615
\end{align*}
\]

\[
\begin{align*}
3) & \quad 3x + 5y = 2 \\
   & \quad x = 7y + 4 \\
   & \quad x = 1.307692 \quad 3 \\
   & \quad y = 0.38461 \xi
\end{align*}
\]

**Closing Activity:** Real-life situation that utilizes linear solutions.

\[
\begin{align*}
& \quad y = \$900 + 250x \\
& \quad y = \$650x \\
& \quad x = 225 \\
& \quad y = 14625
\end{align*}
\]

**Assignment:** page 55, # 1 – 6 all (to nearest hundredth)

1- (-0.78, -1.67)  
2- (-0.92, -3.37)  
3- (-0.88, -2.86)  
4- (3.93, 7.19)  
5- (0.37, -0.70)  
6- (0.46, -0.01)
Day 2 - Lesson Plan

Objectives: The students will be able solve linear systems of equations by graphing, substitution, and elimination plotting the results by hand on coordinate graph.

Prerequisites: The students can manually solve systems of linear equations. The students can graph ordered pairs from individual linear equations.

Materials and Resources:
- Standard classroom
- Overhead Projector
- Graph Paper
- Textbook
- TI-83 Plus Calculator

Performance Standard:
- New York State: Students will use aspects of Mathematical Analysis (1); Information Systems (2); Reasoning, Number & Numerations, Operations, Modeling/Multiple Representation; Patterns/Functions and Measurement (3.1-3.5, 3.7); Interconnectedness - Models (6.2); Interdisciplinary Problem solving (7).
- NCTM: Students will use aspects of Problem Solving; Communication; Reasoning; Connections; Algebra; Functions.
**Opening Activity:**
**Purpose:** To review with students the manual methods of solving systems of linear equations by graphing to relate to previous days lesson.
- Students will solve the following system of equation by graphing.
  \[ y = \frac{1}{2}x \]
  \[ y = \frac{3}{2}x + 4 \]
  Students will compare their results to those developed on the TI-83 Plus.

**Developmental Activity:**
- Students will solve the following system of equation by substitution.
  \[ x = 4y - 5 \]
  \[ 2y + x = 1 \]
- Students will solve the following system of equation by elimination.
  \[ 3x - 4y = 1200 \]
  \[ 2x + y = 55 \]
- Students will receive guided practice solving problems taken from the textbook using the substitution and elimination methods (page 59, #5-10).

**Closing Activity:**
- Students will use solve a real-life situation taken from the textbook using the substitution and elimination methods. (page 61, #30)
- Students will compare their manual results to those developed on the TI-83 Plus.

**Assignment:** pages 60-61, # 17–27 odd, 29, 31 & 32
**Purpose:** To reinforce the concepts presented today, provide practice using manual methods of solving linear systems, and prepare students to apply the methods to real-life applications.
**Teachers Notes:**

**Opening Activity:** Demonstrate coordinate graphing as a method of solving equations.

\[ y = \frac{1}{2} x \]
\[ y = \frac{3}{2} x + 4 \]
\[ x = \frac{2}{2} \]
\[ y = 1 \]

**Developmental Activity:** Reinforce substitution and elimination methods.

- **Substitution.**
  
  \[
  \begin{align*}
  & x = 4y - 5 \\
  & 2y + x = 1
  \end{align*}
  \]

  \[
  \begin{align*}
  & 2y + 4y - 5 = 1 \\
  & 6y - 5 = 1 \\
  & 6y = 6 \\
  & y = 1 \\
  & x = 4(1) - 5 \\
  & 2y + x = 1
  \end{align*}
  \]

- **Elimination.**
  
  \[
  \begin{align*}
  & 3(20) - 4y = 120 \\
  & 2x + y = 55 \\
  & 2x + 4y = 220 \\
  & 5x = 10 \\
  & 60 - 4y = 120 \\
  & y = 150
  \end{align*}
  \]

- **Textbook:** page 59, #5-10
  
  5-yes, 6-no, 7-no, 8-yes, 9-no, 10-yes

**Closing Activity:** Practice using real-life situation.

- **Textbook:** page 61, #30

  a) 
  
  \[ y = 5x + 200 \]
  
  \[ 15x = 5x + 200 \]
  
  \[ x = 200 \]
  
  \[ y = 15x \]
  
  10x = 2000
  
  y = 150200
  
  b) Since 200 is break even, then profit is made at the 201 shirt sold.

**Assignment:**

<table>
<thead>
<tr>
<th>17-(0,4)</th>
<th>21-(4,2)</th>
<th>25-(12,2)</th>
<th>29-(2,-3), (-1,1), (8,5)</th>
<th>32-300 3-bed &amp;</th>
</tr>
</thead>
<tbody>
<tr>
<td>19-(2,0)</td>
<td>23-(2,3)</td>
<td>27-(5.25,0.75)</td>
<td>31-70 soybeans/30 corn</td>
<td>100 4-bed.</td>
</tr>
</tbody>
</table>

Kelthy – Page 8
**Day 3 - Lesson Plan**

**Objectives:** The students will be able to use a TI-83 Plus graphing calculator to perform various operations on matrices.

**Prerequisites:** The students can manually solve systems of equations for two or more unknown variables.

**Materials and Resources:**
- Standard classroom
- Overhead Projector
- TI-83 Plus Calculator
- TI View screen
- Textbook

**Performance Standard:**
- New York State: Students will use aspects of Mathematical Analysis (1); Information Systems (2); Reasoning, Number & Numerations, Operations, Modeling/Multiple Representation; Patterns/Functions and Measurement (3.1-3.5, 3.7); Technology (5.3-5.4); Interconnectedness - Models (6.2); Interdisciplinary Problem solving (7).
- NCTM: Students will use aspects of Problem Solving; Communication; Reasoning; Connections; Algebra; Functions.
Opening Activity:
Purpose: To review with students the manual methods of solving a system of equations.
  - Students will solve the following system of equations manually.

\[
\begin{align*}
x + 3y &= 2 \\
2x - y &= 10
\end{align*}
\]
\[
\begin{align*}
x + y + z &= 9 \\
2x + y + z &= 5 \\
3x + 2y + z &= 8
\end{align*}
\]

Developmental Activity: (See worksheet)
  - Students will enter matrices on a TI-83 Plus Graphing Calculator
  - Students will calculate matrix addition and multiplication using the TI-83 Plus Graphing Calculator.
  - Students will find the determinant and the inverse of the matrices entered using the TI-83 Plus Graphing Calculator.

Closing Activity:
  - Students will be given guided practice to solve systems of equations using TI-83 Plus Graphing Calculator listed on the worksheet.

Assignment: pages 63, # 1–18 all
Purpose: To reinforce the concepts presented today, provide practice using the TI_83 Plus to calculate matrix addition, multiplication, determinant, and inverse.
Worksheet: page 1

TI-83 Plus - Matrix Data usage:

Given the following matrices:

\[
A = \begin{bmatrix} 1 & 3 \\ 2 & 4 \end{bmatrix} \quad B = \begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix} \quad C = \begin{bmatrix} 1 & 2 \\ 4 & 3 \end{bmatrix}
\]

Entering Data:
- [2nd], [Matrix], >> [EDIT] and choose the matrix ([A], [B], [C], etc) you wish to use.
- For A: [2nd], [Matrix], >> [EDIT] 1 2 [ENTER] 2 [ENTER] 1 [ENTER] 3 [ENTER] 2 [ENTER] 2 [ENTER] [2nd] [QUIT]
- For B: [2nd], [Matrix], >> [EDIT] 2 2 [ENTER] 2 [ENTER] 2 [ENTER] (-) 1 [ENTER] 1 [ENTER] 3 [ENTER] [2nd] [QUIT]
- For C: [2nd], [Matrix], >> [EDIT] 3 2 [ENTER] 2 [ENTER] (-) 1 [ENTER] 2 [ENTER] 4 [ENTER] (-) 2 [ENTER] [2nd] [QUIT]

You can display the matrix by pressing [2nd] [MATRIX] 1, 2, or 3 [ENTER] to verify your input.

Addition/Subtraction/Multiplication:
Find the following:

\[
\begin{align*}
A + B & \quad A + C & \quad B + C \\
A - B & \quad A - C & \quad B - A \\
AB & \quad BC & \quad BA
\end{align*}
\]

- Start with a cleared screen. Enter [2nd] and then choose the respective matrix you wish to use ([A], [B], [C], etc).
- Select the mathematical operation you wish to employ (+, -, *)
- Enter [2nd] and then choose the other respective matrix you wish to use ([A], [B], [C], etc).
- Press [ENTER] to compute and see the results.
- If operation is possible, the matrix results will be visible.
- If not, ERR:DIM MISMATCH will appear to denote an impossible operation/combination of matrices.

Finding the Determinant:
- [2nd] [MATRIX] >> [MATH] 1 [2nd] [MATRIX] and then matrix you are calculating the determinant for, “(”), [ENTER]

**screen view:** $\text{det}(A)$

Finding the Inverse of a matrix:
- [2nd] [MATRIX] > [ $x^{-1}$ ] [ENTER]

**screen view:** $A^{-1}$
Worksheet: page 2

Solving Matrices for unknown variables:

Given the matrices: \[ \begin{bmatrix} 1 & 3 & x \\ 2 & 2 & y \end{bmatrix} = \begin{bmatrix} 10 \\ 4 \end{bmatrix} \]
where \[ A = \begin{bmatrix} 1 & 3 \\ 2 & 2 \end{bmatrix} \] and \[ B = \begin{bmatrix} 10 \\ 4 \end{bmatrix} \]

- Enter two matrices: The first one, \([A]\), represents the coefficients of the variables.
- The other, \([B]\), represents the value/solution matrix.
- \([2^{nd}} [\text{Matrix}] 1 \ [x^{1}]\) (Your screen should look like this: \([A]^{1}\))
- \([2^{nd}} [\text{Matrix}] 2 \ [\text{ENTER}]\)

This should list the results of the variables in the order they were entered in the original matrix.

Practice Problems:

1) \[ x + 3y = 2 \]
   \[ 2x \square \ y = \square 10 \]
   \[ x + y + z = 9 \]

2) \[ 2x \square \ y + z = 5 \]
   \[ 3x + 2y \square \ z = 8 \]

3) \[ \begin{bmatrix} 1 & 3 & x \\ 2 & 2 & y \end{bmatrix} = \begin{bmatrix} 10 \\ 4 \end{bmatrix} \]

4) \[ \begin{bmatrix} 2 & 3 & 2 \end{bmatrix} \begin{bmatrix} x \\ 1 \\ 2 \end{bmatrix} = \begin{bmatrix} 1 \\ 9 \end{bmatrix} \]
Teachers Notes:

Opening Activity:

\[
\begin{align*}
\text{x + 3y} & = 2 & \text{x + y + z} & = 9 & \text{3(2) + 2z} & = 14 \\
2x & = 10 & 2x + y + z & = 5 & 6 + 2z & = 14 \\
2(3y + 2) & = y & 3x + 2y & = 8 & 2z & = 8 \\
6y + 4 & = 10 & z & = 4 \\
7y & = 14 & 3x + 2z & = 14 \\
y = 2 & 7x + z & = 18 & 2 + y + 4 & = 9 \\
2x + 2 & = 10 & 6 + y & = 9 \\
x & = 8 & 11x & = 22 & y & = 3 \\
x & = 2
\end{align*}
\]

Developmental Activity:

Given the following matrices: \(A = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix} \)
\(B = \begin{bmatrix} 2 & 1 \\ 3 & 4 \end{bmatrix} \)
\(C = \begin{bmatrix} 1 & 2 \\ 4 & 3 \end{bmatrix} \)

\[
\begin{align*}
A + B & = \begin{bmatrix} 3 & 2 \\ 5 & 6 \end{bmatrix} & A + C & = \begin{bmatrix} 0 & 5 \\ 6 & 1 \end{bmatrix} & B + C & = \begin{bmatrix} 1 & 1 \\ 5 & 0 \end{bmatrix} & A \cdot B & = \begin{bmatrix} 1 & 4 \\ 1 & 1 \end{bmatrix} \\
A \cdot C & = \begin{bmatrix} 2 & 1 \\ 5 & 1 \end{bmatrix} & B \cdot A & = \begin{bmatrix} 1 & 4 \\ 1 & 1 \end{bmatrix} & AB & = \begin{bmatrix} 5 & 8 \\ 6 & 4 \end{bmatrix} & BC & = \begin{bmatrix} 6 & 7 \\ 11 & 7 \end{bmatrix} \\
BA & = \begin{bmatrix} 0 & 4 \\ 7 & 9 \end{bmatrix} & \text{NOTE:} & AB & \neq BA
\end{align*}
\]

Closing Activity:

1) \[
\begin{align*}
x + 3y & = 2 \\
2x + y & = 10
\end{align*}
\]
2) \[
\begin{align*}
x + y + z & = 9 \\
2x + y & = 5 \\
3x + 2y + z & = 8
\end{align*}
\]
3) \[
\begin{align*}
1 & 3 \\
2 & 2
\end{align*}
\]
4) \[
\begin{align*}
2 & 3 \\
1 & 2
\end{align*}
\]

Assignment: Answers in Teachers Textbook
Day 4 - Lesson Plan

**Objectives:** The students will use perform various operations on matrices manually.

**Prerequisites:** The students must be able to use the associative and commutative properties of multiplication.

**Materials and Resources:**
- Standard classroom
- Blackboard
- Textbook

**Performance Standard:**
- New York State: Students will use aspects of Mathematical Analysis (1); Information Systems (2); Reasoning, Number & Numerations, Operations, Modeling/Multiple Representation; Patterns/Functions and Measurement (3.1-3.5, 3.7); Interconnectedness - Models (6.2); Interdisciplinary Problem solving (7).
- NCTM: Students will use aspects of Problem Solving; Communication; Reasoning; Connections; Algebra; Functions.
Opening Activity:
Purpose: To define matrices, their properties and the operations that can be performed with them to solve systems of equations.
- Students will review associative property of multiplication.
- Students will review commutative property of multiplication.
- Students through direct interaction will define matrices by rows and columns.

Developmental Activity: (Textbook pages 64-67, 71-74)
Using examples from the textbook:
- Students will perform addition operations on matrices manually.
- Students will perform subtraction operations on matrices manually.
- Students will perform multiplication operations on matrices manually.
- Students will calculate the determinant of a matrix manually.
- Students will calculate the inverse of a matrix manually.

Closing Activity:
- Students will be given guided practice to solve systems of equations manually using matrices by calculating the determinant and inverse.

Assignment: page 68, # 17 – 39 odd and page 75, # 13 – 25 odd
Purpose: To reinforce the concepts presented today, provide practice to calculate matrix addition, multiplication, determinant, and inverse.
Teachers Notes:

Opening Activity:

**Associative:**

\[ 8 \cdot (2 \cdot 3) = (8 \cdot 2) \cdot 3 \]

**Commutative:**

\[ 4(3 + 4) = 4(4 + 3) \]

\[ x(yz) = (xy)z = xyz \]

\[ x(y + z) = x(z + y) = xy + xz \]

Matrix:

- **Row** - The horizontal line of numbers (data) in a matrix (*left to right*)
- **Column** – The vertical line of numbers (data) in a matrix (*top to bottom*)

**Row x Column** -

Ex. \[ A = \begin{bmatrix} 1 & 3 \\ 2 & 2 \end{bmatrix} \] is a 2 x 2 Matrix

\[ B = \begin{bmatrix} a & b & c & d \end{bmatrix} \] is a 1 x 4 Matrix

\[ C = \begin{bmatrix} 1 & 4 \\ 0 & 1 \\ 2 & 1 \\ 2 & 2 \\ 3 & 3 \end{bmatrix} \] is a 5 x 2 Matrix

Developmental Activity:

- Use Examples #1-6 pp. 65-67 from textbook for addition, subtraction and multiplication.
- Use Examples #1-4 pp. 71-73 from textbook for determinant and inverse development.

Closing Activity:

- Problems #5, 9, 11 page 68 from textbook for addition, subtraction and multiplication practice.
- Use Examples #6, 10, 12 page 75 from textbook for determinant and inverse practice.

Assignment: Answers in Teachers Textbook
Day 5 - Lesson Plan

Objectives: The students will use the TI-83 Plus graphing calculator to explore methods of solving systems of equation.

Prerequisites: The students should be familiar with graphing linear equations and inequalities to determine if the given points satisfy the equation. Students must know the concept of a vertex of a polygon.

Materials and Resources:
- Standard classroom
- Overhead Projector
- TI-83 Plus Calculator
- TI View screen
- Textbook
- Toothpicks
- Graphing Paper

Performance Standard:
- New York State: Students will use aspects of Mathematical Analysis (1); Information Systems (2); Reasoning, Number & Numerations, Operations, Modeling/Multiple Representation; Patterns/Functions and Measurement (3.1-3.5, 3.7); Technology (5.3-5.4); Interconnectedness - Models (6.2); Interdisciplinary Problem solving (7).
- NCTM: Students will use aspects of Problem Solving; Communication; Reasoning; Connections; Algebra; Functions.
**Opening Activity:**

**Purpose:** To have students explore polygons and reintroduce concepts of vertex of a polygon and examine the equations which make up a polygon on a grid.
- Students will create various polygons (triangle, square, rectangle, pentagon) using toothpicks on grid paper.
- Students will determine the coordinate points of the intersection of sides of each polygon.
- Students will compute the equations of the side of the polygon (linear).

**Developmental Activity:** (See worksheet)
- Students will solve systems of inequalities by graphing on the TI-83 Plus Graphing Calculator
- Students will use vertex points to determine optimum results of the system of equations identifying feasible regions on the TI-83 Graphing Calculator.

**Closing Activity:**
- Students will be given guided practice to solve linear inequality systems using real-life problems modeled on the TI-83 Plus Graphing Calculator.

**Assignment:** pages 89, # 9–17 odd, # 21, 22

**Purpose:** To reinforce the concepts presented today, provide practice using the TI-83 Plus to determine feasible regions of inequalities.
Worksheet:

Entering Data:

Given:

(1) \[ \begin{align*}
    y & \geq x + 4 \\
    y & \geq 2x + 2
\end{align*} \]

(2) \[ \begin{align*}
    y & = 4 \\
    y & \geq x + 8
\end{align*} \]

To solve the following systems of linear equations follow these steps:

1- Enter \([Y=] \ 1 \ [X,T,\theta, n] + 4 \ [ENTER] \ \text{–} \ [X,T,\theta, n] + 4 \)

2- To enter inequality you must \(\text{–} \) arrow left of the \(Y_1=\) and \(Y_2=\). Then \[ENTER\] twice for greater than or \[ENTER\] three times for less than. Now \[GRAPH\]

3- If no graph appears: \([2^{\text{nd}}] \ [Y=] \ 4 \ [ENTER]\) this makes sure STATS PLOTS are Off \[ZOOM\] 6 to fit graph on screen

4- Since the results may be difficult to see, you may have to adjust the view screen. To do this key \[WINDOW\] to adjust you X and Y min/max/scale to get a better picture.

5- Enter \([2^{\text{nd}}] \ [\text{CALC}] \ 5 \ [ENTER] \ [ENTER] \ [ENTER]\) will now list the intersection point of both linear equations \((X=0, Y=4)\) for system (1)

6- Repeat steps for system (2) entering 3 equations following the same method.

Graph the systems from the textbook on pages 87 & 88, examples 1, 2, & 3 using the TI-83 Plus.

- The results you develop should match those in drawn in the textbook.

Classroom Challenge: Page 90 -#20

- Pick a work partner.

- Using graph paper graph the system of equations to form an irregular hexagon.

- Use the TI-83 to match the results developed by hand.
Teachers Notes:

Opening Activity:
- Students should create polygons that fit the coordinate grid so the vertex points can be easily determined.
- They should be guided to develop the equation of each side so the vertex of each joining side can be examined.

Developmental Activity:
- Students will graph a couple systems of inequalities given on the worksheet.
- Students will examine and attempt to match the graphs given on pages 87-88 in the textbook with guided practice from the teacher.

Closing Activity:
- Students will team up in pairs
- Students will graph by hand the six inequalities from page 90, # 20 on graph paper.
- Students will enter these inequalities in their TI-83’s and compare their results.

Assignment: Answers in Teachers Textbook