**DAILY LESSON PLAN**

**Week of:** March 19th

**Date:** 3/20/07

**Grade:** Alg II

**Subject:** MATH

**General Topic:** Systems of Linear Equations

**Today's Topic:** Solving Systems of Equations Symbolically Cont'd & Solving using Matrices

**Expected Student Learning Outcomes:**

What will students know and be able to do as a result of today's lesson? Solve systems of equations using the substitution method, linear combination method, and solving these equations using matrices.

**Standards Addressed:**

Which learning standard from the MA Frameworks or WPS curriculum does today's lesson address?

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</table>

**School Improvement Plan:**

Which (if any) literacy strategy does today's lesson address?

**LEARN TO READ/READ TO LEARN**

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**LEARN TO WRITE/WRITE TO LEARN**

- "I wonder" log entries
- Letters
- Metacognitive Logs
- Exit slips
- 2 Column notes

Solve problems using linear equations/inequalities

Apply algebraic and graphical methods to solutions

**Outline of Lesson Activities:**

*(to be posted on classroom agenda)*

**Discuss classwork & HW from 3/19**

- Pg. 174 # 6-10, 17, Pg. 176 # 30-34

**Do pg. 174 # 17-22 (re-inforce substitution & linear combination)**

Discuss: pg. 174 # 17-22 and route students to do them on the board and explain

**HW: Worksheet # 1-6**

**Assessment:**

How will you assess students' understanding of today's lesson?

- Test
- Quiz
- Verbal Questioning
- Group Work
- Homework (written or reading)
- Project Presentation
- Portfolios
- Other:
March 20, 2007

Solving Systems of Equations Cont’d
Ch. 3-1 Part B

Discuss
- class work: pg. 174 #6-10 and 12
- HW: pg. 176 # 30-34

Group work: Pg. 174 # 17-22

Discuss
- Group work (Have students put problems on the board and explain)

HW: Worksheet #1-6
March 20, 2007

Solving Systems of Equations Symbolically Cont’d.
Ch. 3-1 Part B

Discuss:
- Classwork pg. 174 # 6-10, 12 -1 Done #4, 7
- HW pg. 176 # 30-34

30. \[ \text{Substitution} \]
   \[ y = x + 2 \]
   \[ x + y = 8 \]
   
   \[ x + x + 2 = 8 \]
   \[ 2x + 2 = 8 \]
   \[ 2x = 6 \]
   \[ x = 3 \]
   \[ 2 \]
   \[ (3, 5) \]

   \[ y = 3 + 2 \]
   \[ y = 5 \]

31. \[ \text{Linear Combination} \]
   \[ 2(x + 3y = -65) \]
   \[ 2x - y = -25 \]
   \[ -2x - 6y = -130 \]
   \[ 2x + (-15) = -25 \]
   \[ 2x = -10 \]
   \[ x = -5 \]
   \[ (-20, -15) \]

32. \[ \text{Linear Combination} \]
   \[ 3(7x - 4y = 8) \]
   \[ 2(3x + 6y = 15) \]
   \[ 21x - 12y = 24 \]
   \[ 6x + 12y = 30 \]
   \[ 27x = 54 \]
   \[ x = 2 \]
   \[ 3(2) + 6y = 15 \]
   \[ 6y = 9 \]
   \[ y = 3/2 \]

33. \[ \text{Linear Combination} \]
   \[ 3(2x + 3y = 13) \]
   \[ -2(3x - 5y = 10) \]
   \[ 6x + 9y = 39 \]
   \[ -6x + 10y = -20 \]
   \[ 19y = 19 \]
   \[ y = 1 \]
   \[ 2x + 3(1) = 13 \]
   \[ 2x = 10 \]
   \[ x = 5 \]
   \[ (5, 1) \]
\[ y = \frac{8}{3}x - 5.9 \]
\[ x - 3y - 15 = 0 \]

\[ 3 \left( -\frac{1}{3}x + y = -5.9 \right) \quad \text{NO solution} \]
\[ \left[ x - 3y = 15 \right] \]
\[ -x + 3y = -17.7 \]
\[ 0 = -18.2 \]

\[ 3x + 2y = 16 \]
\[ -2(7x + y = 19) \]
\[ 3x + 2y = 16 \]
\[ -14x - 2y = -38 \]
\[ -11x = -22 \]
\[ x = 2 \]

\[ 3(2) + 2y = 16 \]
\[ 6 + 2y = 16 \]
\[ -6 \]
\[ 2y = 10 \]
\[ y = 5 \]

\[ 2x - y + 2 = 0 \]
\[ 16x + 12y - 1 = 0 + 1 \]
\[ -y + 3y - 6 = 0 + 0 \]
\[ 15y = 7 \]
\[ \frac{15y}{15} = \frac{7}{15} \]
\[ y = \frac{7}{15} \]
\[ 2x - \frac{7}{15} + 2 = 0 \]
\[ \frac{30}{15} = \frac{23}{15} \]
\[ x = \frac{-23}{30} \quad \left( \frac{-23}{30}, \frac{7}{15} \right) \]

\[ 5x - 3y = -1 \]
\[ -3x + 3y = -7 \]
\[ 0 = -8 \]

\[ \text{NO solution.} \]
Reteach
Chapter 3

What you should learn:
3.2 How to solve a linear system using algebraic methods.

Examples Using Algebraic Methods to Solve Linear Systems

a. Use the substitution method to solve the system. \[
\begin{align*}
6x + y &= -2 \\
4x - 3y &= 17
\end{align*}
\]  
Equation 1  
Equation 2

Write Equation 1 in slope-intercept form.

\[
\begin{align*}
y &= -6x - 2 \\
4x - 3y &= 17
\end{align*}
\]

Equation 2

Substitute \(-6x - 2\) for \(y\) in Equation 2.

\[
\begin{align*}
4x + 18x + 6 &= 17 \\
x &= \frac{1}{2}
\end{align*}
\]

Distributive Property

Simplify.

Solve for \(x\).

\[
\begin{align*}
y &= -6x - 2 \\
y &= -6\left(\frac{1}{2}\right) - 2
\end{align*}
\]

Slope-intercept form of Equation 1

Substitute \(\frac{1}{2}\) for \(x\).

\[
y = -5
\]

Solve for \(y\). The solution is \(\left(\frac{1}{2}, -5\right)\).

b. Use the linear combination method to solve the system. \[
\begin{align*}
5x - 3y &= 14 \\
3x - 2y &= 6
\end{align*}
\]  
Equation 1  
Equation 2

To obtain coefficients for \(x\) that differ in sign, multiply Equation 1 by 3.

\[
\begin{align*}
15x - 9y &= 42 \\
-15x + 10y &= -30
\end{align*}
\]

Multiply Equation 2 by \(-5\).

\[
\begin{align*}
y &= 12 \\
3x - 2y &= 6
\end{align*}
\]

Add the equations. From the result, you know that \(y = 12\).

\[
\begin{align*}
3x - 2(12) &= 6 \\
x &= 10
\end{align*}
\]

Substitute 12 for \(y\).

Solve for \(x\). The solution is \((10, 12)\).

Guidelines:

To use algebraic methods to solve a system of linear equations:

- If one of the equations has a variable with a coefficient of 1, then use the substitution method as outlined on page 130 of the textbook.
- Otherwise, use the linear combination method as outlined on page 131 of the textbook.

EXERCISES

In 1–6, solve the system using an algebraic method.

1. \[
\begin{align*}
2x - y &= 6 \\
2x + 2y &= -9
\end{align*}
\]

2. \[
\begin{align*}
-2x + 3y &= 5 \\
3x - 2y &= 0
\end{align*}
\]

3. \[
\begin{align*}
2x + 3y &= 7 \\
x - 2y &= -7
\end{align*}
\]

4. \[
\begin{align*}
2x - 5y &= -4 \\
4x + 3y &= 5
\end{align*}
\]

5. \[
\begin{align*}
11x + 6y &= 1 \\
3x + 2y &= -3
\end{align*}
\]

6. \[
\begin{align*}
4x - 3y &= 5 \\
-8x + 6y &= 17
\end{align*}
\]
**DAILY LESSON PLAN**

**Week of:** March 19th  
**Date:** 3/21/07  
**Grade:** 10  
**Subject:** MATH

**General Topic:** Systems of Linear Equations  
**Today's Topic:** Solving systems using Matrices

**Expected Student Learning Outcomes:**  
- What will students know and be able to do as a result of today's lesson?  
  To use inverse matrices to solve systems of linear equations.

**Standards Addressed:**  
- Which learning standard from the MA Frameworks or WPS curriculum does today's lesson address?  
  1. Number Sense  
  2. Patterns, Relations & Functions  
  3. Geometry & Measurement  
  4. Statistics & Probability

**School Improvement Plan:**  
- Which (if any) literacy strategy does today's lesson address?  
  **LEARN TO READ/READ TO LEARN**  
  - Pre-Reading  
    - Preview Text  
    - Ask Questions  
    - Activate Prior Knowledge  
  - Guided Reading  
    - Make connections  
    - Visualize  
    - Think aloud strategy  
  - Post Reading  
    - Low Stakes Writing  
    - Projects  
    - Presentations

  **LEARN TO WRITE/WRITE TO LEARN**  
  - "I wonder" log entries  
  - Exit slips  
  - 2 Column notes  
  - Metacognitive Logs

- Solve problems using linear equations/inequalities  
- Apply algebraic and graphical methods to solutions

**Outline of Lesson Activities:**  
(to be posted on classroom agenda)  
- Discuss HW: worksheet #1-6  
- Lecture:  
  1. How to cut systems of equations into Ax = B form  
  2. How to find the inverse of the matrix using a graphing calculator  
  3. How to solve the system of equations by multiplying the inverse x constants (B Matrix)

- DO "Try It" pg. 17 #8 & 18  
- Group work: pg. 182 #2-5, pg. 183 #12  
- HW: pg. 183 #12-14, pg. 184 #27-32 (just write matrix)

**Assessment:**  
- How will you assess students' understanding of today's lesson?  
  - Test - Quiz - Verbal Questioning - Group Work - Homework (written or reading) - Project Presentation - Portfolios - Other:
March 21, 2007

Solving Systems Using Matrices
Ch. 3-1 Part C

Discuss HW: worksheet #1-6

Introduce solving systems using matrices:
Note: Explain this requires steps.

- Show students how to put a system of equations into \( AX = B \) form.
  \[
  A = \begin{bmatrix}
  2 & 1 \\
  5 & -3
  \end{bmatrix}, \quad 
  x = \begin{bmatrix}
  x \\
  y
  \end{bmatrix}, \quad
  \begin{bmatrix}
  -1 \\
  1
  \end{bmatrix}
  \]
  \[
  B = \begin{bmatrix}
  2x + 3y = -2 \\
  -3x & -5y = 2
  \end{bmatrix}, \quad
  \begin{bmatrix}
  3x - 4y = 7 \\
  -2x + y = -3
  \end{bmatrix}
  \]
  \[
  \begin{bmatrix}
  \frac{3}{2} \\
  -3
  \end{bmatrix}
  \]

Examples: Put equations in \( Ax + By = C \) Form

\[
\begin{align*}
2x - y &= -1 \\
5x - 3y &= 1
\end{align*}
\]
\[
\begin{bmatrix}
2 & -1 \\
5 & -3
\end{bmatrix}
\begin{bmatrix}
x \\
y
\end{bmatrix}
= \begin{bmatrix}
-1 \\
1
\end{bmatrix}
\]
\[
\begin{align*}
2x + 3y &= -2 \\
-3x - 5y &= 2
\end{align*}
\]
\[
\begin{bmatrix}
2 & 3 \\
-3 & 5
\end{bmatrix}
\begin{bmatrix}
x \\
y
\end{bmatrix}
= \begin{bmatrix}
-2 \\
2
\end{bmatrix}
\]
\[
\begin{align*}
3x - 4y &= 7 \\
-2x + y &= -3
\end{align*}
\]
\[
\begin{bmatrix}
3 & -4 \\
-2 & 1
\end{bmatrix}
\begin{bmatrix}
x \\
y
\end{bmatrix}
= \begin{bmatrix}
7 \\
-3
\end{bmatrix}
\]

- Give a matrix and have students put it back into a standard equation.

Examples:

\[
\begin{bmatrix}
-2 & 0 \\
1 & 1
\end{bmatrix}
\begin{bmatrix}
x \\
y
\end{bmatrix}
= \begin{bmatrix}
4 \\
4
\end{bmatrix}
\]
\[
\begin{align*}
x - 2y &= 4 \\
x + y &= 4
\end{align*}
\]
\[
\begin{align*}
x &= \begin{bmatrix}
4 \\
0
\end{bmatrix}
\end{align*}
\]

\[
\begin{bmatrix}
3 & 1 \\
2 & 3
\end{bmatrix}
\begin{bmatrix}
x \\
y
\end{bmatrix}
= \begin{bmatrix}
6 \\
-3
\end{bmatrix}
\]
\[
\begin{align*}
3x + y &= 6 \\
2x + 3y &= -3
\end{align*}
\]
\[
\begin{align*}
x &= \begin{bmatrix}
6 \\
-3
\end{bmatrix}
\end{align*}
\]

\[
\begin{bmatrix}
2 & -1 \\
0 & 1
\end{bmatrix}
\begin{bmatrix}
x \\
y
\end{bmatrix}
= \begin{bmatrix}
-4 \\
3
\end{bmatrix}
\]
\[
\begin{align*}
2x - y &= -4 \\
y &= 3
\end{align*}
\]
\[
\begin{bmatrix}
-1 \\
-2
\end{bmatrix}
\begin{bmatrix}
x \\
y
\end{bmatrix}
= \begin{bmatrix}
-2 \\
0
\end{bmatrix}
\]
\[
\begin{align*}
\frac{1}{2}x - y &= -2 \\
-x + 2y &= 0
\end{align*}
\]
\[
\begin{align*}
\frac{1}{2}x &= y \\
y &= \frac{1}{2}x
\end{align*}
\]
- Explain how to plug in the matrix they create according to the system of equations into a graphing calculator.
- Explain how to find the inverse of the matrix using a graphing calculator.
- Explain how the inverse is used in solving the systems of equations on graphing calculator.
- Now solve by multiplying the inverse of the matrix by the constants.

Examples:

<table>
<thead>
<tr>
<th>Use previous examples but plug it into calc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>c, d → calculator</td>
</tr>
<tr>
<td>e. 4g + 500s = 3992  \hspace{1cm}</td>
</tr>
<tr>
<td>8g + 200s = 4088           \hspace{1cm}</td>
</tr>
<tr>
<td>f, g, h → calculator</td>
</tr>
</tbody>
</table>

- f: No inconsistent → parallel
- g: No, same line
- h: Yes → unique

Do "Try It" Pg. 181 c, d, e, f, g, h

Group work: pg. 182 # 2-5 pg. 183 #12
HW: pg. 183 # 13&14 pg. 184 # 27-32 (just write the matrix)

### How to use matrices to solve systems of equations:
- Put the equation in AX=B Form
- Put the equations in matrix form
- Find the inverse of the equation using graphing calculator
- Multiply the inverse by the constants (B)
- Solve

Using calculators to solve:
- 2nd Matrix
- Go to edit
• Plug in the 2X2 matrix and the 2X1 matrix
• Quit, 2\textsuperscript{nd} matrix inverse AXB
• Solution
**Examples**

**Using Algebraic Methods to Solve Linear Systems**

**a.** Use the substitution method to solve the system.  
\[
\begin{align*}
6x + y &= -2 \\
4x - 3y &= 17
\end{align*}
\]

Write Equation 1 in slope-intercept form.

\[
y = -6x - 2
\]

Equation 2

\[
4x - 3y = 17
\]

Substitute \(-6x - 2\) for \(y\) in Equation 2.

\[
4x + 18x + 6 = 17
\]

Simplify.

\[
22x = 11
\]

Solve for \(x\).

\[
x = \frac{1}{2}
\]

\[
y = -6x - 2
\]

Slope-intercept form of Equation 1

\[
y = -6\left(\frac{1}{2}\right) - 2
\]

Substitute \(\frac{1}{2}\) for \(x\).

\[
y = -5
\]

Solve for \(y\). The solution is \((\frac{1}{2}, -5)\).

**b.** Use the linear combination method to solve the system.  
\[
\begin{align*}
5x - 3y &= 14 \\
3x - 2y &= 6
\end{align*}
\]

To obtain coefficients for \(x\) that differ in sign, multiply Equation 1 by 3.

\[
15x - 9y = 42
\]

Multiply Equation 2 by \(-5\).

\[
-15x + 10y = -30
\]

Add the equations. From the result, you know that \(y = 12\).

\[
y = 12
\]

Equation 2

\[
3x - 2y = 6
\]

Substitute 12 for \(y\).

\[
x = 10
\]

Solve for \(x\). The solution is \((10, 12)\).

**Guidelines:**

To use algebraic methods to solve a system of linear equations:

- If one of the equations has a variable with a coefficient of 1, then use the substitution method as outlined on page 130 of the textbook.
- Otherwise, use the linear combination method as outlined on page 131 of the textbook.

**EXERCISES**

In 1–6, solve the system using an algebraic method.

1. \[
\begin{align*}
2x - y &= 6 \\
2x + 2y &= -9
\end{align*}
\]

2. \[
\begin{align*}
-2x + 3y &= 5 \\
3x - 2y &= 0
\end{align*}
\]

3. \[
\begin{align*}
2x + 3y &= 7 \\
x - 2y &= -7
\end{align*}
\]

4. \[
\begin{align*}
2x - 5y &= -4 \\
4x + 3y &= 5
\end{align*}
\]

5. \[
\begin{align*}
11x + 6y &= 1 \\
3x + 2y &= -3
\end{align*}
\]

6. \[
\begin{align*}
4x - 3y &= 5 \\
-8x + 6y &= 17
\end{align*}
\]
### Daily Lesson Plan

**Date:** 3.22.07

**Subject:** Math

**General Topic:** Solving systems of linear equations

**Today's Topic:** Systems with 3 variables

**Expected Student Learning Outcomes:** What will students know and be able to do as a result of today's lesson?

- To solve 3×3 systems of linear equations.

**Standards Addressed:** WIS.10.

**School Improvement Plan:** Which (if any) literacy strategy does today's lesson address?

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**Outline of Lesson Activities:** (to be posted on classroom agenda)

- Discuss HW: pg. 184 # 27-32
- Quiz: Solving systems of equations with two variables
- Notes: Do pg. 189 Explore
- Do pg. 189 "Try It"
- Do pg. 190 # 2-4
- HW pg. 192 # 19 & 20

**Assessment:** How will you assess students' understanding of today's lesson?

- Test
- Quiz
- Verbal questioning
- Group work
- Homework (written or reading)
- Project presentation
- Portfolios
- Other:
Quiz: Solving Systems of Equations with Two Variables

Use the graphing method to solve for #1.

1. \[ y = 3x - 5 \]
   \[ y = \frac{2}{3}x + 2 \]

Use substitution, linear combination, or matrices to solve for #2-5.
Note: (You can only use a matrix for one problem and show the matrix in \( AX = B \) form)

2. \[ x + y = 11 \]
   \[ 3x - y = 5 \]

3. \[ -5x + y = 12 \]
   \[ y = 5x + 13 \]
Extra Credit
Solving systems of Equations with two variables

Write a system of equations for the word problem and solve for the number of children and adults that attended the fair.

The admission fee at a small fair is $1.50 for children and $4.00 for adults. On a certain day, 2200 people enter the fair and $5050 is collected. How many children and how many adults attended?
Name: ______________________________________

Quiz: Solving Systems of Equations with Two Variables

Use the graphing method to solve for #1.

1. \[ 2x + 3y = 1 \]
   \[ x - 2y = 4 \]

2. \[ x + y = 5 \]
   \[ y = -x + 3 \]
Name: Answer Key
Quiz: Solving Systems of Equations with Two Variables

Use the graphing method to solve for #1.

1. \[ y = 3x - 5 \]
   \[ y = \frac{2}{3}x + 2 \]

\[
\begin{array}{c|c}
 x & y \\
\hline
 0 & -5 \\
 1 & -2 \\
\end{array}
\quad \begin{array}{c|c}
 x & y \\
\hline
 0 & 2 \\
 3 & 4 \\
\end{array}
\]

\[
(3, 4)
\]

Use substitution, linear combination, or matrices to solve for #2-5.
Note: (You can only use a matrix for one problem and show the matrix in AX=B form)

2. \[
x + y = 11
\]
   \[3x - y = 5\]

\[
\begin{array}{c|c}
 4x & = 16 \\
\hline
 4 & 4
\end{array}
\]

\[ x = 4 \]

\[ y = 7 \]

\[
(4, 7)
\]

3. \[
-5x + y = 12
\]
   \[y = 5x + 13\]

\[
\begin{array}{c|c}
 -5x + y & = 12 \\
\hline
 -1(-5x + y & = 13 ) \\
 5x - y & = -13
\end{array}
\]

\[ 0 = -1 \]

NO SOLUTION
4. \[\begin{align*}
5x + 3y &= 7 \\
3x &= -23 + 5y
\end{align*}\]

\[
\begin{align*}
3(5x + 3y) &= 7 \\
-5(3x - 5y) &= -23
\end{align*}\]

\[
\begin{align*}
5x + 3(4) &= 7 \\
5x + 12 &= 7 \\
5x &= -5 \\
x &= -1
\end{align*}\]

\[
\begin{align*}
-15x + 9y &= 21 \\
-15x + 25y &= 115
\end{align*}\]

\[
\begin{align*}
34y &= 130 \\
\frac{34y}{34} &= \frac{130}{34}
\end{align*}\]

\[
y = 4
\]

\[
(x, y) = (-1, 4)
\]

5. \[\begin{align*}
3x - y &= 8 \\
-3(x + 2y) &= 5
\end{align*}\]

\[
\begin{align*}
-3x - 6y &= -15
\end{align*}\]

\[
\begin{align*}
-7y &= -7 \\
y &= 1
\end{align*}\]

\[
\begin{align*}
3x - 1 &= 8 \\
3x &= 9 \\
x &= 3
\end{align*}\]

\[
(x, y) = (3, 1)
\]
Extra Credit
Solving systems of Equations with two variables

Write a system of equations for the word problem and solve for the number of children and adults that attended the fair.

The admission fee at a small fair is $1.50 for children and $4.00 for adults. On a certain day, 2200 people enter the fair and $5050 is collected. How many children and how many adults attended?

\[ a + c = 2200 \]
\[ 4a + 1.5c = 5050 \]

Then solve the system for the number of adults and the number of children:

\[ a = 2200 - c \]
\[ 4(2200 - c) + 1.5c = 5050 \]
\[ 8800 - 4c + 1.5c = 5050 \]
\[ 8800 - 2.5c = 5050 \]
\[ -2.5c = -3750 \]
\[ c = 1500 \]

\[ a = 2200 - (1500) = 700 \]

There were 1500 children and 700 adults.
March 22, 2007

Discuss:
HW: pg. 184 #27-32 (solve)

Quiz:
Solving systems of equations using graphing, substitution, linear combination, and matrices.

Systems with 3 Variables
Ch. 3-1 Part D

Do pg. 189 Explore: Technology to the Rescue with class.

Explain how to solve systems of equations with three variables:
Linear Combination:

\[ \begin{align*}
1) & \quad x + 3y + 2z = 9 \\
2) & \quad x - y + 3z = 16 \\
3) & \quad 3x - 4y + 2z = 28 \\
\end{align*} \]

\[ \begin{align*}
x + 3y + 2z &= 9 \\
x - y + 3z &= 16 \\
3x - 4y + 2z &= 28 \\
\end{align*} \]

\[ \begin{align*}
-x + y - 3z &= -16 \\
-4y + 2z &= -80 \\
29z &= -87 \\
2z &= 3 \\
\end{align*} \]

Substitution:

\[ \begin{align*}
x + 3y + 2z &= 9 \\
x - y + 3z &= 16 \\
3x - 4y + 2z &= 28 \\
\end{align*} \]

\[ \begin{align*}
x &= -3y - 2z + 9 \\
(-3y - 2z + 9) - y + 3z &= 16 \\
3(-3y - 2z + 9) - 4y + 2z &= 28 \\
-9y - 6z + 27 - 4y + 2z &= 28 \\
-13y - 4z &= 1 \\
\end{align*} \]

Like terms

\[ \begin{align*}
-13y - 4(4y + 7) &= 1 \\
-13y - 16y - 28 &= 1 \\
-29y &= 29 \\
y &= -1 \\
\end{align*} \]
Do pg. 189 “Try It” (a & b)

1. \(-x + y + z = 5\)
   \[-2x - 2y + z = 7\]
   \[2x + y + 3z = 5\]
   \[-3x + 4y - 2z = 14\]
   \[5y + z = 9\]

2. \[x - y - 2z = -5\]
   \[-x - 2y + z = -7\]
   \[-3y = -12\]
   \[y = 4\]

B → Other Sheet

Do pg. 190 #2-4

2. \(x = 2\)
   \[2x + 3z = 13\]
   \[-3y + z = -10\]
   \[2 - 3y + 3z = -10\]
   \[-3y + 5 = -10\]
   \[-y = -5\]
   \[y = 5\]

3. \[(x + 2 = 5)\]
   \[-2x + y + z = -5\]
   \[3x - 2y + z = 9\]
   \[x - y = 4\]
   \[2x - 2y - 2z = 9\]
   \[x + 10y + 2 = 5\]
   \[-4x - 2y = 14\]
   \[-2(x - y = 4)\]
   \[-2x + 2y = -8\]
   \[2x = 6\]
   \[x = 3\]

HW: pg. 192 #19 & 20
1. \[20.25x + 25.60y + 31.50z = 978 \text{ wages}\]
2. \[3x + 4y + 5z = 150 \text{ pieces}\]
3. \[x + y + z = 41 \text{ hours}\]

\[
\begin{bmatrix}
20.25 & 25.60 & 31.50 \\
3 & 4 & 5 \\
1 & 1 & 1 \\
\end{bmatrix}
\begin{bmatrix}
x \\
y \\
z \\
\end{bmatrix}
= 
\begin{bmatrix}
978 \\
150 \\
41 \\
\end{bmatrix}
\]

3. \(a^{-1}\)
4. Solve on calc.
5. Inequalities → Time on machine to make part ≤ 41
   Labor cost ≤ 978

"Try It"  

\[b: \begin{align*}
-2(4x + 3y + 5z &= 730 \\
3(6x + 2y + 3z &= 595 \\
-1(1x + 2y + 8z &= 770) \\
\end{align*}\]

\[
\begin{align*}
40 + 2(y) + 8(75) &= 770 \\
600 + 2y + 600 &= 595 \\
y &= -65 \\
\frac{130}{2} - 2y - 82 &= -770 \\
5x - 5z &= -175 \\
(40) - 5z &= -175 \\
200 - 5z &= -175 \\
\frac{-200}{-5} &= \frac{-5z}{-5} \\
z &= 75
\end{align*}\]
# Daily Lesson Plan

**General Topic:** Solving Systems of Linear Equations

**Today's Topic:** Solving Systems of Equations with 3 Variables

**Expected Student Learning Outcomes:**

What will students know and be able to do as a result of today's lesson?

- Solving Systems of Equations with three variables.

**Standards Addressed:**

AII P.10

**School Improvement Plan:**

Which (if any) literacy strategy does today's lesson address?

**LEARN TO READ / READ TO LEARN**

- Pre-Reading
  - Preview Text
  - Ask Questions
  - Activate Prior Knowledge

- Guided Reading
  - Make Connections
  - Visualize
  - Think Aloud Strategy

- Post Reading
  - Low Stakes Writing
  - Projects
  - Presentations

**LEARN TO WRITE / WRITE TO LEARN**

- "I wonder" Log Entries
- Letters
- Exit Slips
- 2 Column Notes
- Metacognitive Logs

- Check: Solve problems using linear equations/inequalities
- Apply algebraic and graphical methods to solutions

**Outline of Lesson Activities:**

*Discuss HW pg. 192 #19-20

*Notes: Solving Systems of Equations with 3 Variables

- Do Examples

*Group Work: worksheet B10 #1-9 odd

*HW: worksheet B-D #1-8 even

**Assessment:**

How will you assess students' understanding of today's lesson?

- Test - Quiz - Verbal Questioning - Group Work - Homework (written or reading) - Project Presentation - Portfolios - Other: 
March 23, 2007
Ch. 3-1 Part D Cont’d

Discuss HW: pg. 192 # 19&20
Do more systems with 3 variable equations. (attached sheet)
Group work:
Discuss
HW:
Solve each system of linear equations if possible.

1. \[ x - y = -1 \]
   \[ y + z = 1 \]
   \[ 3x + 2y + z = 10 \]

2. \[ 2x + z = 7 \]
   \[ x + y + z = 0 \]
   \[ 2x + 3y - 2z = -8 \]

3. \[ x + y - z = 3 \]
   \[ 2x - y + z = 5 \]
   \[ x - 2y = 4 \]

4. \[ 3x - y + 2z = 20 \]
   \[ 3x + y - 2z = 4 \]
   \[ x + 2y + z = 3 \]

5. \[ x - z = -3 \]
   \[ x - y + 2z = 6 \]
   \[ 2x + 3y - z = 7 \]

6. \[ x + 2y - z = 5 \]
   \[ 3x - 2y + 5z = 31 \]
   \[ -x + 2y - z = -5 \]

7. Find the measures of the three angles of a triangle if the sum of twice the measure of the first angle and three times the measure of the second angle equals the measure of the third angle, and if the measure of the second angle is 3° more than the measure of the first angle.

8. Yesterday three customers at Kay’s Market bought dates, endives, and/or figs, as shown in the table. Find the price per pound of each item.

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<td>0 lb</td>
<td>2 lb</td>
<td>$6.20</td>
</tr>
<tr>
<td>Customer 3</td>
<td>1 lb</td>
<td>1 lb</td>
<td>1 lb</td>
<td>$4.70</td>
</tr>
</tbody>
</table>

Write each system of linear equations as a matrix equation in the form \( AX = B \). Then use a graphing utility to solve each system of linear equations using matrices if possible.

9. \[ 2x + 4y + 3z = 6 \]
   \[ 4x - 2y + z = 4 \]
   \[ -x + 3y + 4z = -2 \]

10. \[ 5x - 2y + 3z = 4 \]
    \[ -2x + 4y + 6z = 3 \]
    \[ 8x + 7y - 3z = -6 \]

11. \[ 2x - 3y + z = 4 \]
    \[ -5x + 2y + 3z = -3 \]
    \[ \frac{3}{8}x + \frac{7}{4}y + \frac{3}{4}z = 6 \]

12. \[ 3.5x + 2.2y - 2.7z = 4.3 \]
    \[ 4.3x - 1.8y + 2.3z = 2.5 \]
    \[ 3.6x + 1.3y + 5.3z = 2.9 \]
19. \( x+y = 3 \)
   \( 2x-y = 9 \)
   \[
   \begin{align*}
   3x+y+2z &= 1 \\
   4+y &= 3 \\
   -4 -4 &= -4 \\
   y &= -1 \\
   3(4) -1+2z &= 1 \\
   12-1+2z &= 1 \\
   11 &= 1+z \\
   -11 -11 &= z \\
   2z &= -10 \\
   z &= -5 \\
   (4, -1, -5)
   \end{align*}
   \]

20. \( 2x+3y = -2 \)
   \( 4y+2z = -10 \)
   \( 3x+5z = 1 \)
   \[
   \begin{align*}
   0(2x+3y+2z &= -2) \\
   3x+0y+5z &= 1 \\
   0x+0y+0z &= 0 \\
   3x+5z &= 1
   \end{align*}
   \]
Examples:

\[
\begin{align*}
2x + 2y + z &= 6 \\
2x - y + 3z &= -2 \\
x + y - 2z &= 0 \\
\hline
-2(2x + 2y + z) &= -12 \\
2x - y + 3z &= -2 \\
-2x - 4y - 2z &= -12 \\
\hline
-5y + z &= -14
\end{align*}
\]

\[
\begin{align*}
-x - 2y - z &= -6 \\
\hline
-y - 3z &= -6
\end{align*}
\]

\[
\begin{align*}
x + y - 2z &= 0 \\
5(-y - 3z) &= -15 \\
5y + 15z &= 30 \\
\hline
16z &= 16 \\
16 &= 16 \\
\hline
z &= 1
\end{align*}
\]

\[
\begin{align*}
-3 &+ 3 \\
-3 &= -3 \\
\hline
y &= 3
\end{align*}
\]

\[
\begin{align*}
x + 2(3) + 1 &= 6 \\
x &= 1
\end{align*}
\]

\[
\begin{align*}
x - y + 2z &= 5 \\
3x + 2y - z &= -2 \\
2x + y + 3z &= 10 \\
3(3x + 2y - z) &= -6 \\
\sum (2x + y + 3z = 10) \\
-9x + 6y - 3z &= -6 \\
\hline
11x + 7y &= 4
\end{align*}
\]

\[
\begin{align*}
x - y + 2z &= 5 \\
3x + 2y - z &= -2 \\
\hline
-7(4x + y = 3) \\
-11x + 7y &= 4 \\
-28x - y &= -21 \\
\hline
17x &= 17 \\
x &= 1
\end{align*}
\]

\[
\begin{align*}
4(1) + y &= 3 \\
4 + y &= 3 \\
\hline
y &= -1
\end{align*}
\]

\[
\begin{align*}
1 - 7 + 2 &= 5 \\
2 + z &= 5 \\
\frac{z}{2} &= 3 \\
z &= 6
\end{align*}
\]
**DAILY LESSON PLAN**

**Week of:** March 25

**General Topic:** Solving Systems of Linear Inequalities

**Today's Topic:** Solving Systems of Linear Inequalities

**Expected Student Learning Outcomes**

- Solve systems of equations of inequality by graphing.

**Standards Addressed:**

- Which learning standard from the MA Frameworks or WPS curriculum does today's lesson address?
  - Number Sense
  - Patterns, Relations & Functions
  - Geometry & Measurement
  - Statistics & Probability

**School Improvement Plan**

**Which (if any) literacy strategy does today's lesson address?**

**LEARN TO READ/READ TO LEARN**

- Pre-Reading
  - Preview Text
  - Ask Questions
  - Activate Prior Knowledge

- Guided Reading
  - Make connections
  - Visualize
  - Think aloud strategy

- Post Reading
  - Low stakes Writing
  - Projects
  - Presentations

**LEARN TO WRITE/WRITE TO LEARN**

- "I wonder" log entries
- Letters
- 2 Column notes

- Solve problems using linear equations/inequalities
- Apply algebraic and graphical methods to solutions

**Outline of Lesson Activities:**

(to be posted on classroom agenda)

- **Discuss HW & Classwork #1-8 on Worksheet**
- **Notes:** How to Solve Systems of Linear Inequalities
  - Put Equation into y = mx + b
  - Graph, Shade
  - Solution = overlapping shaded regions

- **Do pg. 202 #13**
- **Group Work Worksheet "Graphing Inequalities" #10**
- **HW pg. 203 #33-38**

**Assessment:**

- How will you assess students understanding of today's lesson?
  - Test - Quiz - Verbal Questioning - Group Work - Homework (written or reading) - Project Presentation - Portfolios - Other:
March 26th 2007
Ch. 3-2 Part A
Systems of Inequalities

Discuss HW and class work #1-8 on worksheet. Use calculator.

Notes:
How to solve systems of linear inequalities
- Put equation in y = mx + b
- Graph both equations on the same grid
  - < or > - - - -
  - < or > -------
- y < shade below the line
- y > shade above the line
- Solution to the system of equations is the region with the overlapping shading.

Do pg. 202 #13

Group work: worksheet “Graphing Inequalities” #1-6
Discuss
HW: pg. 203 #33-38

Examples:
1. \(3x + y \leq 5\)
   \(y \geq 1\)
   \(x \geq 1\)
   \(3x + y \leq 5 - 3x\)
   \(-3x\)
   \(y \leq 5 - 3x\)
   \(x | 0\)
   \(y | 5, 2\)
Graph the feasible region for each of the following sets of constraints (inequalities). Then find the coordinates of the vertices.

1. \[ y \geq \frac{1}{3}x - 2, \ y \leq 2x + 3, \ y \leq -\frac{4}{3}x + 3 \]
   vertices

2. \[ x \geq -3, \ y \geq -2, \ 2x + y \leq 6, \ 2y - x \leq 7 \]
   vertices

3. \[ x \geq 0, \ y \geq 0, \ y \leq -\frac{1}{2}x + 7, \ y \leq -3x + 24 \]
   vertices

4. \[ x \geq 0, \ y \geq 0, \ y \leq -\frac{1}{4}x + 40, \ y \geq \frac{3}{2}x - 30 \]
   vertices

Write a set of linear inequalities to model the constraints in each situation. Then graph the feasible region and find the coordinates of its vertices.

5. A restaurant has 25 tables. Some of the tables \((x)\) are reserved, and the rest are available for walk-in customers. The restaurant never reserves more than 15 tables.
   inequalities
   vertices

6. Red marbles cost 15¢ and turquoise ones cost 25¢. Jimbo has $1.75 to spend on red and turquoise marbles, and he will buy at most 5 red marbles.
   inequalities
   vertices
Answers

12. \[
\begin{bmatrix}
3.5 & 2.2 & -2.7 \\
4.3 & -1.8 & 2.3 \\
3.6 & 1.3 & 5.3
\end{bmatrix}
\begin{bmatrix}
x \\
y \\
z
\end{bmatrix}
= \begin{bmatrix}
4.3 \\
2.5 \\
2.9
\end{bmatrix};
x \approx 0.842, y \approx 0.450, z \approx -0.135
\]

3-1 Part E
1. (b) 2. (a) 3. (2, -5); 1 solution; consistent
4. (3, -5); 1 solution; consistent 5. (3, 2); 1 solution; consistent
6. All ordered pairs that satisfy \(2x + 3y = 5\); infinitely many solutions; consistent
7. (-4, -5); 1 solution; consistent 8. No solution; inconsistent
9. 9 gal regular and 6 gal premium
10. \[
\begin{bmatrix}
3 & -2 \\
-7 & 5
\end{bmatrix}
\begin{bmatrix}
x \\
y
\end{bmatrix}
= \begin{bmatrix}
-4 \\
3
\end{bmatrix}; x = 14, y = -19
\]
11. \[
\begin{bmatrix}
1 & -3 & -1 \\
-2 & 6 & 3
\end{bmatrix}
\begin{bmatrix}
x \\
y \\
z
\end{bmatrix}
= \begin{bmatrix}
2 \\
-2
\end{bmatrix}; x = 13, y = 0, z = 8
\]
12. Asparagus: $2.00; Broccoli: $1.00; Cabbage: $0.50

3-2 Part A
1.

2.

3. Possible answer: Let \(x\) be the amount that Maria
spends; \(x \leq 300\)
4. Possible answer: Let \(n\) be the
number of notebooks that Jose buys; \(n \geq 5\)
5.

6.

7. a. \(x + y \leq 2000; x \leq \frac{2}{3}y\)
   b. \(x \geq 0; y \geq 0\)

3-2 Part C
1. Possible answer: \(P = 5b + 20p\)
   \(C = 90b + 60v\)
2. Possible answer: \(N = x + y\)
3. Possible answer: \(n = x + y\)
4. a. \(x \geq 5, y \geq 0, y \leq 15, x + y \leq 25\)
b. (5, 0), (5, 15), (10, 15), (25, 0)
c. \(l = 5x + 7y\)
d. (10, 15); He should
work 10 hours for X and
15 hours for Y.
   e. $155
5. a. \(x \geq 0, y \geq 0, 0.4x + 0.3y \leq 18; 0.1x + 0.35y \leq 10\)
b. (0, 0), (0, 28\frac{1}{3}), (30, 20), (45, 0)
c. \(F = x + y\)
d. (30, 20);
Use 30 pounds of Amazin'Oats and 20 pounds of
Nutty Surprise.
   e. 50 pounds
Solve each system of linear equations if possible.

1. \[ x - y = -1 \]
   \[ y + z = 1 \]
   \[ 3x + 2y + z = 10 \]

2. \[ 2x + z = 7 \]
   \[ x + y + z = 0 \]
   \[ 2x + 3y - 2z = -8 \]

3. \[ x + y - z = 3 \]
   \[ 2x - y + z = 5 \]
   \[ x - 2y = 4 \]

4. \[ 3x - y + 2z = 20 \]
   \[ 3x + y - 2z = 4 \]
   \[ x + 2y + z = 3 \]

5. \[ x - z = -3 \]
   \[ x - y + 2z = 6 \]
   \[ 2x + 3y - z = 7 \]

6. \[ x + 2y - z = 5 \]
   \[ 3x - 2y + 5z = 31 \]
   \[ -x + 2y - z = -5 \]

7. Find the measures of the three angles of a triangle if the sum of twice the measure of the first angle and three times the measure of the second angle equals the measure of the third angle, and if the measure of the second angle is 3° more than the measure of the first angle.

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