Algebra/Geometry Institute Summer 2004
Lesson Plan One

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School: Indianola Gentry
City: Indianola, MS
Grade Level: 10th grade Algebra II

1 Teaching objective(s)

- Identify and define the components of a matrix in terms of their elements by identifying rows and columns.

2 Instructional Activities

- **As students enter the classroom they will be instructed to complete the "Do Now" assignment written on the board. The assignment will consist of defining the following nine vocabulary terms: matrix, row, column, element, row matrix, column matrix, zero matrix, and dimensions. These definitions can be found in the textbook and are to be written in the students notebooks. (10 minutes)**

- **Class discussion will begin with the following opener:**

  Imagine you have just won a free trip and free tickets to see your favorite basketball team play. Could your luck get any better? Yes it can! To top it all off; if you can find your seat within 2 minutes, you will win $1,000,000. Remember you have never been to the arena so you do not have a clue as to how to begin to find a seat. In fact, you had to wear a blindfold. Now, you are standing on the center of the court. The arena is full of spectators hoping you will win. The blindfold comes off. The seat number is C25, and the seats are arranged in a rectangular fashion. What do you do? In this unit we will begin examining matrices. If you are ever in the situation just mentioned, and you

know a little about a matrix, you might just become a millionaire. (5 minutes)

- Students will then be asked to identify examples of rectangular arrays in the world around them which could be viewed as matrices. The basketball seating arrangement will be further discussed in terms of rows and columns. Students will be asked to consider the C component of the seat number the horizontal element known as the row. In a similar manner, the 25 component of the seat number will be viewed as the vertical element or the column. Rows and columns will be further discussed using examples such as vertical columns found on porches, and horizontal rows found in gardens. Students will also discuss examples of objects that are described using dimensions such as: four by four trucks, two by four lumber boards, and five by seven pictures. The teacher must clarify that the examples of items described using dimensions are not examples of matrices. The idea is to help students realize that they are familiar with the notation used to describe matrix dimensions. Students must understand that when matrix dimensions are written "2x3", this is stated as "two by three", and the "x" between the dimensions is not a multiplication symbol. Students will then discuss and answer (while the teacher facilitates) the oral exercises from the textbook on page 676 (20 minutes).

Sample problems from the oral exercise are as follows:

$$\text{Let } A = \begin{bmatrix} 6 & 3 & 4 & 0 \\ 2 & 7 & 12 & 2 \\ 1 & 5 & 0 & 1 \end{bmatrix}$$

State each of the following.

1. The dimensions of *A* (3x4)
2. The elements in the second column (3,7,5)
3. The elements in the third row (1,5,0,1)
4. The element in row two, column four (2)
5. The element in row one, column two (3)

- As a closing exercise, each student will receive a note card with a row and a seat number (e.g. row 2 seat 3), the student must correctly identify the student seated in the desk listed on the card. Students with the correct response will receive a homework pass, students with an incorrect response will

receive a note instructing them to bring to class additional practice from the internet on matrix elements and dimensions. The homework pass and additional practice notice will be identical in appearance to avoid embarrassment. Students will be informed about a vocabulary quiz the following day. (15 minutes)

3 Materials and Resources

- **Paper**
- **Pencils**
- **Note cards**
- **Internet**
- **Houghton Mifflin, *Algebra and Trigonometry Structure and Method* 1986**

4 Assessment

- **Participation during discussion.**
- **Each student's notebook will be checked at the end of the grading period.**
- **A vocabulary quiz will be given the following day.**

Sample quiz questions:

1. **The horizontal elements of a matrix are known as the (rows).**
2. **The vertical elements of a matrix are known as the (columns).**
3. **Matrices with one row are known as (row matrices).**
4. **A matrix with zero as each element is called a (zero matrix).**
5. **A matrix with an equal number of rows and columns is called a (square matrix).**