Situation 22: Operations with Matrices
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Prompt

Students in an Algebra II class had been discussing the addition of matrices and had worked on several examples of n x n matrices. Most were proficient in finding the sum of two matrices.   Toward the end of the class period, the teacher announced that they were going to begin working on the multiplication of matrices, and challenged the students to find the product of two 3 x 3 matrices:

$$\begin{vmatrix} 2 & 4 & 5 \\ 5 & 2 & 3 \\ 1 & 4 & 4 \end{vmatrix} \quad \text{and} \quad \begin{vmatrix} 1 & 3 & 2 \\ 2 & 6 & 5 \\ 5 & 2 & 3 \end{vmatrix}$$

Students began to work on the problem by multiplying each corresponding term in a way similar to how they had added terms. One student shared his work on the board getting a product of

$$\begin{vmatrix} 2 & 12 & 10 \\ 10 & 12 & 15 \\ 5 & 8 & 12 \end{vmatrix}$$

Question: As the period ended, the teacher asked students to return to the next period with comments about the proposed method of multiplying and alternative proposals.

Commentary

Mathematical Foci

Mathematical Focus 1

Mathematical Focus 2

Mathematical Focus 3

References

Note: adapted from an observation at a Clarke County High School in February 2005.