

CCSS Math Practices Alignment Sample

Activity: “Operating on Matrices” for the TI-84 Plus Family

Note: This alignment sample is intended to highlight opportunities to use TI Technology to help facilitate students’ participation in the CCSS Standards for Mathematical Practice. The prompts and examples provided here are from the Teacher and Student activity documents and demonstrate how the activity can be used to engage students in the Practices. It is possible the activity can be used to engage students in the other Math Practices that are not specified here.

5. Use appropriate tools strategically.

Students should:

- Consider the benefits and limitations of the available tools to decide which are appropriate for solving a given problem.
- Understand how technology can help visualize and explore results, find patterns and compare relationships.
- Use technology to model problems and to analyze and justify their results.
- Use technology to deepen their understanding of concepts.

TI-84 Plus Technology and Teaching Tips:

- Students may find it easy to compute 2x2 matrices by hand. Based on this, ask students to consider situations in which it is better to use a calculator to perform matrix operations.
- Discuss how the calculator adds and subtracts matrices of all sizes. Calculate several examples so that students can form a basis for their conclusions. Use the students’ feedback to establish a rule for matrix addition/subtraction.

6. Attend to precision.

Students should:

- Use clear definitions and precise mathematical language when justifying their conclusions.
- Use correct symbols in expressions, label graphs accurately, specify correct units and appropriately use estimation to solve problems.
- Express numerical answers with the appropriate degree of precision.

TI-84 Plus Technology and Teaching Tips:

- If the calculator displays a dimension mismatch, remind the students to check the dimensions of their matrices before computing sums or products.
- Discuss how multiplying matrices is different from adding or subtracting matrices. What are the criteria for when two matrices can be added or subtracted? Students should be encouraged to communicate these ideas precisely to one another.

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7. Look for and make use of structure.

Students should:

- See the “big picture” in a problem and look for patterns in intermediary results.
- Identify patterns and use previous knowledge to leverage those relationships to solve problems.

TI-84 Plus Technology and Teaching Tips:

- After doing repeated calculations using 2×2 matrices, ask students to make a conjecture about the general form for adding/subtracting matrices.
- Ask students to create a rule for finding the determinant of a 2×2 matrix. Does the same rule apply for a 3×3 matrix?
- Students should be able to discover what matrices can be multiplied by looking at their dimensions and, if they can, tell what the dimension of the product will be.
- Using the results from the table in problem 9, discuss how the determinant affects the inverse of a matrix. What dimensions must a matrix have in order to have a determinant or inverse?