Objective: Apply your understanding of matrices to create an image based on transformations in the coordinate plane.

MGSE9-12.N.VM.12 Work with 2 X 2 matrices as transformations of the plane

Steps:

1. Choose or create an image. This will serve as the pre-image of your 1st transformation in step 3.
2. Overlay a grid and highlight key points. These are the points you will map using transformations. You may do this by hand or in Desmos (or another tool approved by Ms. Jackson) Use a sufficient number of points such that you are able to recognize your transformed image.
3. Perform 2 transformations using matrices. One must be a rotation, and the angle must be approved by Ms. Jackson (Each student will use a different angle, and the angle cannot be a multiple of 90 degrees) Apply 2nd transformation to the image of the 1st transformation. See your notes for assistance.
4. Fill in the details of the image from your final transformation. (The image from the first transformation can be just an outline).

Your final product should include:

- Pre-image with grid and key points highlighted
- Outline of first image and detailed final image on a coordinate plane
- Attached sheet with mathematics clearly showing each transformation using matrices. (The type of each transformation should be clearly labeled)

If you wish to do a project involving fractals, let Ms. Jackson know.

Rubric

	Exceeds Expectations	Meets Expectations	Approaching Expectations	Below Expectations
CATEGORY	**4**	**3**	**2**	**1**
Images & Graphs	Images are clear and reasonably complex. Key points are highlighted. The final image accurately represents the ordered pairs derived mathematically.	Images are clear. Key points are highlighted. The final image accurately represents the ordered pairs derived mathematically.	The final image contains inaccuracies. An insufficient number of points are highlighted in the pre-image.	Instructions not followed. Images unclear or inaccurate.
Mathematical Processes	Matrices are correctly used to derive images from pre-images. Transformations are documented sequentially and clearly labeled. Transformations are sufficiently complex.	Matrices are correctly used to derive images from pre-images. Transformations are documented sequentially and clearly labeled. The required number of transformations was used.	Matrices are used, but with some errors. Transformations not correctly labeled. Fewer transformations performed than required.	Matrices not used or work not shown
Neatness and Organization	The work is presented in a neat, clear, organized fashion that is easy to follow. The images are visually appealing.	The work is presented in a neat, clear, organized fashion that is easy to follow.	The work is hard to follow. It takes effort for the reader to connect the image to the mathematics.	The work appears sloppy and unorganized. It is hard to know what information goes together.