

Welcome to Transformational Geometry: Animated Explorations

While you wait ...

- Go to geogebra.org and download a copy of GeoGebra for your laptop or tablet.
- Please provide your **email** on the provided index card so that we can share our Dropbox folder with you.

Transformational Geometry: Animated Explorations Implementing the Common Core

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Objectives

- Develop a **rich, meaningful, and connected framework** for understanding matrices, vectors, and complex numbers for teachers/students/learners.
- Use technology appropriately.
- Share materials for the classroom.

CCSS for Mathematics

High School Conceptual Category: Number and Quantity

Domain: Vector and Matrix Quantities (N-VM)

Clusters:

- Represent and model with vector quantities.
- **Perform operations on vectors.**
- **Perform operations on matrices and use matrices in applications.**

CCSS for Mathematics

High School Conceptual Category: Number and Quantity

Domain: The Complex Number System (N-CN)

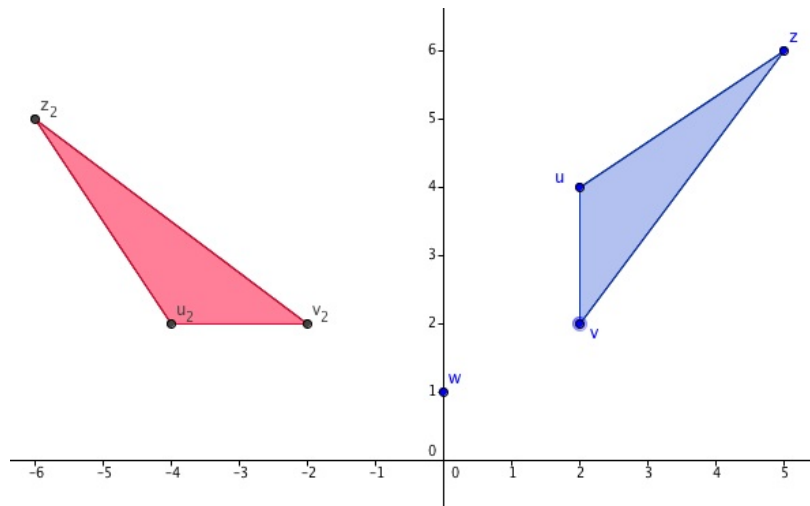
Clusters:

- **Perform arithmetic operations with complex numbers.**
- **Represent complex numbers and their operations on the complex plane.**
- Use complex numbers in polynomial identities and equations.

GeoGebra

free application software from geogebra.org

How could we **transform** the blue triangle into the red triangle?



Applications of Matrices

- Encryption
- Image and Signal Processing
- Search engines
- Model motion

Recap

- Matrices can encode transformations of the plane that fix the origin, such as rotations, dilations, reflections, and combinations of these.
- Matrices naturally act on vectors and with GeoGebra we can have them act on any object in the plane.
- Matrices can generalize mappings between multi-dimensional spaces.

Complex Numbers and Matrices

- If we fix a complex number z_0 , and multiply this number by any other complex number, then z_0 acts like a transformation of the plane that fixes the origin.
- If $z_0 = a + bi$, then its matrix representation, or its representations as a transformation is:

$$\begin{pmatrix} a & -b \\ b & a \end{pmatrix}$$

Questions

THANK YOU!!!

Please feel free to contact us with any other questions at:

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