Precalculus BC Matrix Groups and Roots of Unity Name

1. The ninth roots of unity are depicted in the diagram below.

* 1. List the elements (by letter) and indicate the order of each element.
  2. Pair each element with its inverse.
  3. List a subgroup of this group.
  4. Name a modular group (and operation) that is isomorphic to this group.

1. The complex number, , is a generator of a roots of unity group.
   1. What is the order of this number?
   2. How many elements are in this group?
   3. All these elements satisfy the equation: , where n is what number?
   4. Make a picture of this group (like above).
   5. There are 4 subgroups of this group. List them *(Letter the elements in your picture!)*
2. (*Use of a calculator might be a good idea).* A group of matrices contains the following two elements:

 and 

1. What is the order of A? *(I recommend multiplying A by itself for a while, might as well write down the results while you’re at it!)*
2. What is the order of B?
3. Explain how you know that neither A nor B is a generator.
4. What is the minimum size of the group, given your answers to the above.
5. List the complete group.
6. Describe this group as a set of transformations.
7. Describe this group as an isomorphism of a popular symmetry group.