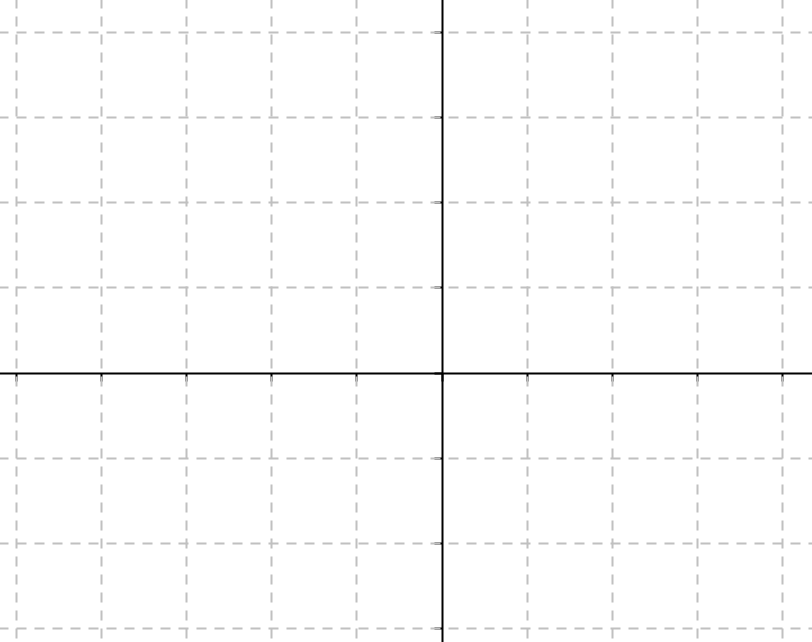
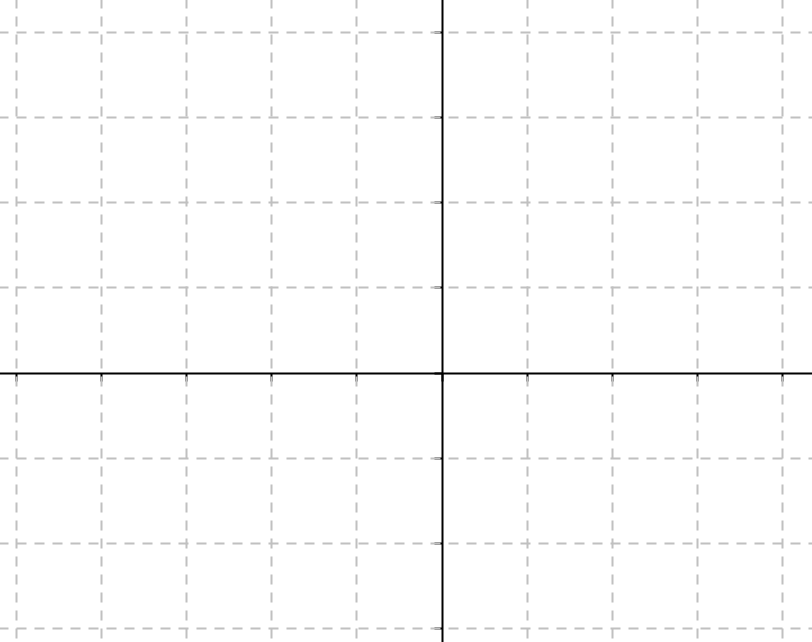
Lesson 9: The Geometric Effect of Some Complex Arithmetic

Classwork

Exercises

1. Taking the conjugate of a complex number corresponds to reflecting a complex number about the real axis. What operation on a complex number induces a reflection across the imaginary axis?
2. Given the complex numbers and   
   , graph each of the following:
3. Describe in your own words the geometric effect adding or subtracting a real number has on a complex number.
4. Given the complex numbers and   
   , graph each of the following:
5. Describe in your own words the geometric effect adding or subtracting an imaginary number has on a complex number.

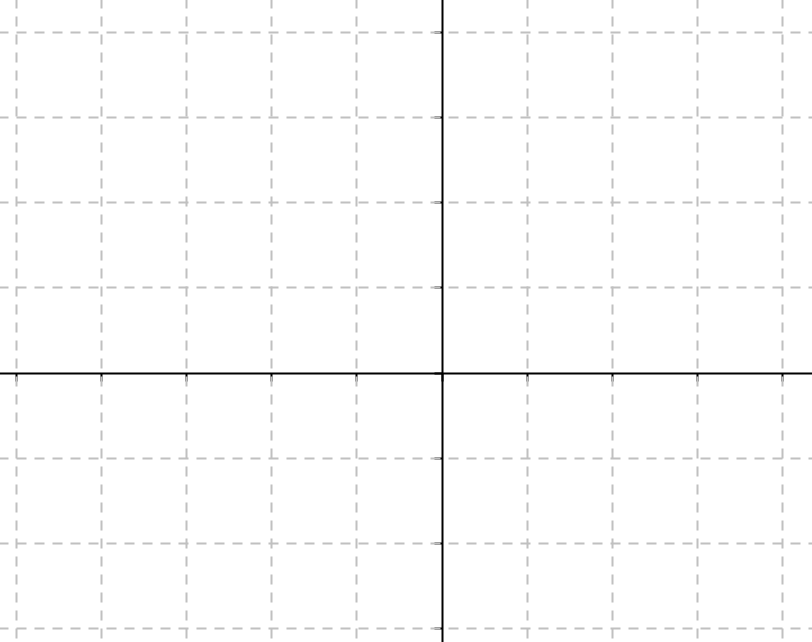
**Example 1**

Given the complex number , find a complex number such that is shifted units in a southwest direction.

Lesson Summary

* The conjugate, , of a complex number , reflects the point across the real axis.
* The negative conjugate, , of a complex number , reflects the point across the imaginary axis.
* Adding or subtracting a real number to a complex number shifts the point left or right on the real (horizontal) axis.
* Adding or subtracting an imaginary number to a complex number shifts the point up or down on the imaginary (vertical) axis.

Problem Set

1. Given the complex numbers and   
   , graph each of the following:
2. Let , find for each case.
   1. is a counterclockwise rotation about the origin of .
   2. is reflected about the imaginary axis from .
   3. is reflected about the real axis from .
3. Let , simplify the following expressions.
4. Given the complex number , find a complex number where is shifted
   1. units in a northeast direction.
   2. units in a southeast direction.