

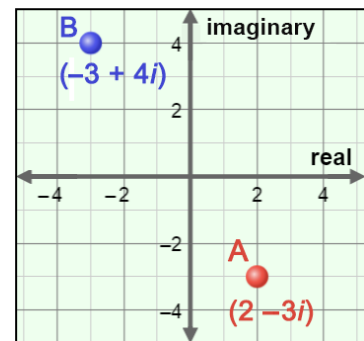


## Vocabulary: Points in the Complex Plane



### Vocabulary

- Additive inverse – a number that, when added to a given number, equals zero.
  - For example, the additive inverse of 4 is  $-4$ , because  $4 + (-4) = 0$ .
- Complex conjugate – a complex number with the same real part as a given complex number and the opposite imaginary part.
  - For example, the complex conjugate ( $\bar{z}$ ) of  $(3 + 2i)$  is  $(3 - 2i)$ .
- Complex number – a number written as  $a + bi$ , where  $a$  and  $b$  are *real numbers* and  $i$  is equal to  $\sqrt{-1}$ .
  - The value  $a$  is the real part of a complex number, and  $bi$  is the imaginary part.
    - For example, the real part of  $2 + 3i$  is 2, and the imaginary part is  $3i$ .
- Complex plane – a plane that represents the set of complex numbers.
  - Like the coordinate plane, the complex plane contains two perpendicular axes, the *real axis* and the *imaginary axis*.
  - In the complex plane to the right, point A represents the complex number  $(2 - 3i)$  and point B represents  $(-3 + 4i)$ .



- Imaginary unit – the imaginary number, called  $i$ , that is defined to be equal to  $\sqrt{-1}$ .
- Imaginary axis – the axis on the complex plane corresponding to the imaginary numbers.
- Imaginary number – any number that can be written in the form  $bi$ , where  $b$  is a real number not equal to zero and  $i$  is equal to  $\sqrt{-1}$ .
  - For example,  $\sqrt{-16} = \sqrt{16} \cdot \sqrt{-1} = 4i$ .
- Quadratic formula – a formula that can be used to find the roots of a quadratic equation of the form  $ax^2 + bx + c = 0$ .
  - The quadratic formula is  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ .
- Real axis – the axis on the complex plane corresponding to the real numbers.
- Real number – a number that represents a value along a continuous number line.
  - The real numbers include zero, all positives and negatives, integers, fractions, decimals, and irrational numbers, but do not include imaginary numbers.

