We know how to find the square root of any positive real number. In a similar way, we can find the square root of any negative number. The difference is that the root is not real.

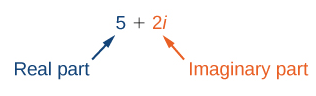
The imaginary number is defined as

The powers of are cyclic. Let’s look at what happens when we raise to increasing powers.

The cycle is repeated continuously: , , , 1, every four powers.

Examples: Evaluate the following.

A complex number is the sum of a real number and an imaginary number. A complex number is expressed in standard form when written in , where is the real part and is the imaginary part.



Just as with real numbers, we can perform arithmetic operations on complex numbers. To add or subtract complex numbers, we combine the real parts and then combine the imaginary parts.

Given two complex numbers, we can find the sum/difference by

Examples: Add or subtract each of the following.