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Complex numbers

File: [complex_numbers.js](#)

```
// complex numbers

// load math.js
var math = require('../index');

// create a complex number with a numeric real and complex part
console.log('create and manipulate complex numbers');
var a = math.complex(2, 3);
print(a);                // 2 + 3i

// read the real and complex parts of the complex number
print(a.re);             // 2
print(a.im);             // 3

// clone a complex value
var clone = a.clone();
print(clone);            // 2 + 3i

// adjust the complex value
a.re = 5;
print(a);                // 5 + 3i

// create a complex number by providing a string with real and complex parts
var b = math.complex('3 - 7i');
print(b);                // 3 - 7i
console.log();

// perform operations with complex numbers
console.log('perform operations');
print(math.add(a, b));    // 8 - 4i
print(math.multiply(a, b)); // 36 - 26i
print(math.sin(a));      // -9.6541254768548 + 2.8416922956064i

// some operations will return a complex number depending on the arguments
print(math.sqrt(4));      // 2
print(math.sqrt(-4));     // 2i

// create a complex number from polar coordinates
console.log('create complex numbers with polar coordinates');
var c = math.complex({r: math.sqrt(2), phi: math.pi / 4});
print(c);                // 1 + i

// get polar coordinates of a complex number
var d = math.complex(3, 4);
```

```
console.log(d.toPolar());      // { r: 5, phi: 0.9272952180016122 }

/**
 * Helper function to output a value in the console. Value will be formatted.
 * @param {*} value
 */
function print (value) {
  var precision = 14;
  console.log(math.format(value, precision));
}
```