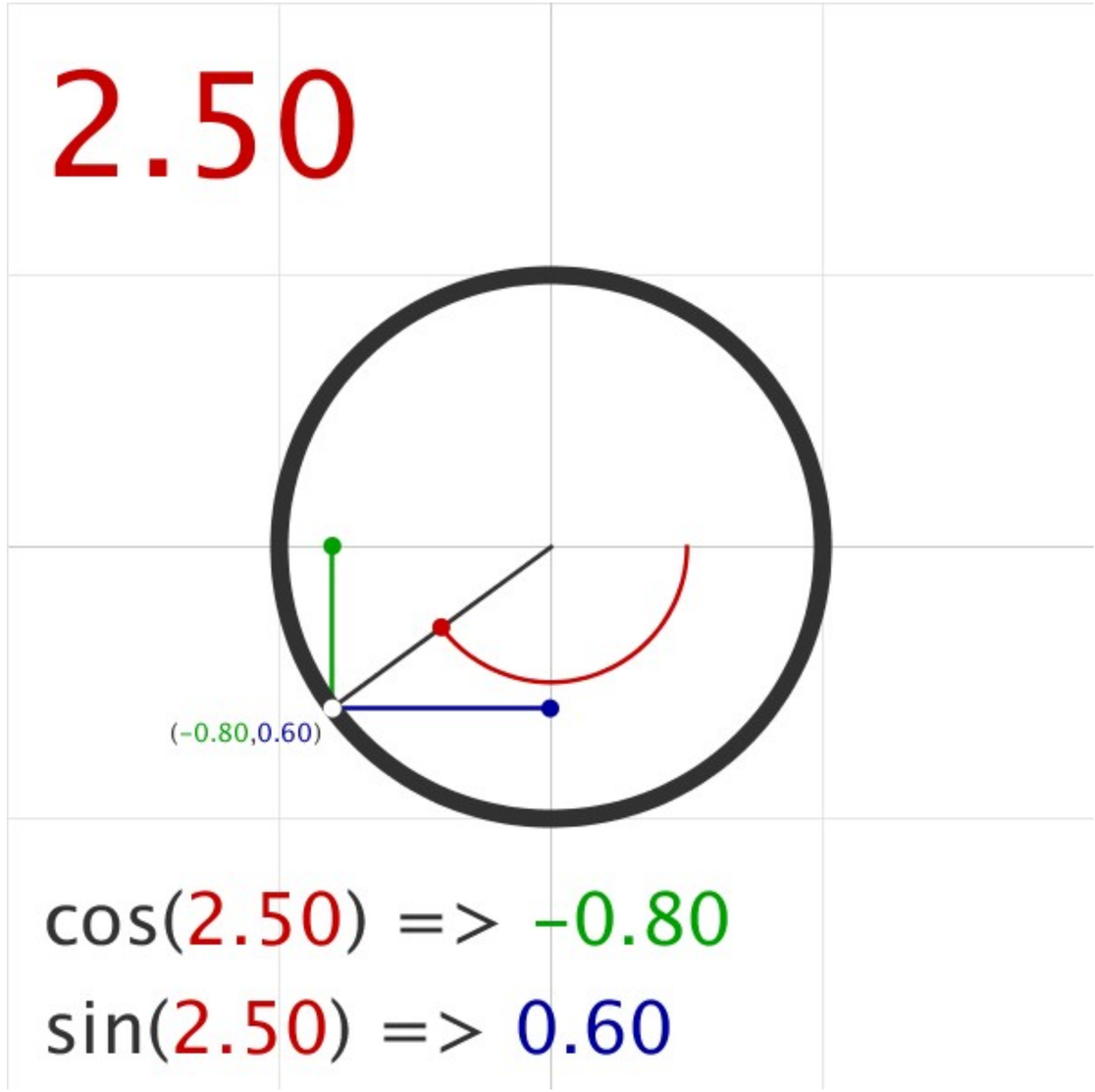
Essential Computing 1

Math



Some methods and constants inside Math class

min(), max()
abs()
pow(), sqrt()
floor(), ceil(), round()
sin(), cos(), tan()
toDegrees(), toRadians()
random()
PI

Many use cases

Some examples …

Math.cos() and **Math.sin()** for finding a point on a circle

```
// Get some input.
double angleDegrees = scanner.nextDouble(); // In degrees.
double radius = scanner.nextDouble();

// Convert to radians.
double angleRadians = Math.toRadians( angleDegrees );

// Compute point on circle.
double x = Math.cos( angleRadians ) * radius;
double y = Math.sin( angleRadians ) * radius;
```

Math.random() for generating random values

```
// Generate a random value between 0 and (less than) 1.
double ran1 = Math.random();

// Generate a random value between 0 and (less than) 10.
double ran2 = Math.random() * 10;

// Generate a random value between 5 and (less than) 10.
double ran3 = 5 + Math.random() * 5;
```

Math.random() for random tests

```
// Fifty fifty chance.
if( Math.random() > 0.5 ){
    System.out.println( "You win" );
} else {
    System.out.println( "You loose" );
}
```

Math.min() and **Math.max()** for constraining values

```
// Constrain a value between 0 and 100.
int value = scanner.nextInt();
int constrained = Math.min( Math.max( value, 0 ), 100 );
```

Math.PI for finding circumference

```
double radius = scanner.nextDouble();
double circumference = radius * 2 * Math.PI;
```