

Introduction to Programming

with Java, for Beginners

Intro to API
Math Class

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Java Library

- Java provides a huge library or collection of useful programs
- A gold mine of well-tested code that can save you countless hours of development time
- This huge library information is provided in *API* - Application Programming Interface

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The Math Class

- Description provided in Java API
- Collection of common math functions (sin, cos, sqrt, etc.).
- And two constants: PI and E

```
> Math.PI
3.141592653589793
> Math.E
2.718281828459045
> Math.sqrt(25)
5.0
> Math.pow(2,10)
1024
> Math.cos(0)
1.0
> Math.cos(2 * Math.PI)
1.0
```

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How the Math Class Works

```
public class Math{
    public static final double PI =
3.141592653589793;

    public static double sin(double d){ .. }
    public static double sqrt(double d) { .. }
    ...
}

> Math.PI
3.141592653589793
> Math.sqrt(25)
5.0
```

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Using Reading Library (API)

- Use the appropriate Java Documentation Version
- Find the documentation for the Math class
 - If you scroll down the lower left panel and click on the link labeled **Math**, the large "main" panel on the right will display the documentation for the Math class

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General Class Interface

- A class' public *interface*
 - Notice the four headings in the main panel.
 - **Field Summary**
 - Has information about public variables
 - **Constructor and Method summaries**
 - Describe the public constructors and methods
 - We will cover constructors soon ...
 - **Method Detail**
 - Provides detail on method inputs (parameter(s))and output (return type) and some extra details
 - The collection of all of a class' public fields, constructors, and methods constitute its "interface", that is, the public face that it shows the world.
 - If method/variable is private, then it will be not a part of its interface.

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Math Class Description

- Notice the phrase **java.lang** at the top of the main panel above the word Math
 - This means that the Math class is part of the core Java language and hence can be used directly
 - Later we see how use classes not part of the java language
- Math Class Interface
 - Field Summary: Has two constants PI and E
 - Constructor Summary: has no public constructor
 - Methods Summary: many methods all which are static
 - Method Details: e.g. sqrt() takes a double and returns a double

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