**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

**The Math Class**

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

```java
public class Math{
    public static final double PI = 3.141592653589793;
    public static double sin(double d){ .. }
    public static double sqrt(double d) { .. }
    ...
}
```

- Example usage:
  ```java
  Math.PI
  3.141592653589793
  Math.sqrt(25)
  5.0
  Math.cos(0)
  1.0
  Math.cos(2 * Math.PI)
  1.0
  ```
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

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.

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