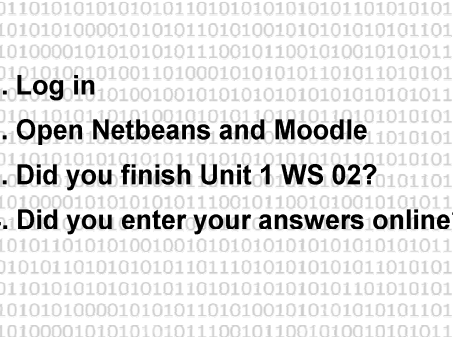




- 1. Log in**
- 2. Open Netbeans and Moodle**
- 3. Did you finish Unit 1 WS 02?**
- 4. Did you enter your answers online?**

Sep 28-7:21 AM

## Math Methods ...

Do you remember that Methods are like mini-programs that have already been written for you ... they do things for you!

`Math.methodName(?);`

Sep 28-9:28 AM

## JAVA Concept: Absolute Value

```
Math.abs(x);           // math method
```

```
int a = 35;  
double b = -4.7;  
System.out.println(Math.abs(b)); // 4.7  
System.out.println(Math.abs(a)); // 35
```

\*\*\* You can input integers and doubles, \*\*\*  
Math.abs(x) can output integers and doubles.

Oct 1-5:37 PM

## JAVA Concept: Exponents or Powers

$$\text{Math.pow}(x,y);$$

```
int c = 3, d = 2;
double e = 2.5;
System.out.println(Math.pow(c,d)); //9.0
System.out.println(Math.pow(d,c)); //8.0
System.out.println(Math.pow(e,d)); //6.25
```

\*\*\* You can input integers and doubles, \*\*\*  
 Math.pow(x,y) will output doubles only.

Oct 1-5:38 PM

## JAVA Concept: Square Root

$$\text{Math.sqrt}(x);$$

```
int a = 9, b = 10;
double c = 24.9;
System.out.println(Math.sqrt(a)); //3.0
System.out.println(Math.sqrt(b)); //3.1622....
System.out.println(Math.sqrt(c)); //4.9899....
```

---

\*\*\* You can input integers and doubles, `Math.sqrt(x)` will output doubles only. \*\*\*

Oct 1-5:38 PM

## JAVA Concept: Greatest Integer Function

Math.floor(x);

```
double i = 9.1, j = 9.7;
int k = 3;
System.out.println(Math.floor(i)); //9.0
System.out.println(Math.floor(j)); //9.0
System.out.println(Math.floor(k)); //3.0
```

\*\*\* You can input integers and doubles, \*\*\*  
Math.floor(x) will output doubles only.

Oct 1-5:40 PM

## JAVA Concept: Round Up

Math.ceil(x);

```
double i = 9.1, j = 9.7, m = -3.8;
int k = 3;
System.out.println(Math.ceil(i)); //10.0
System.out.println(Math.ceil(j)); //10.0
System.out.println(Math.ceil(k)); //3.0
System.out.println(Math.ceil(m)); //-3.0
```

\*\*\* You can input integers and doubles,  
Math.floor(x) will output doubles only. \*\*\*

Oct 1-5:40 PM

## JAVA Concept: Comparison Tests

Math.min(x,y) OR Math.max(x,y)

```
int p=5,q=6, r=-7;
double s=-6.4, t=-4.2;
System.out.println(Math.min(p,q)); // 5
System.out.println(Math.min(s, t)); // -6.4
System.out.println(Math.max(s, t)); // -4.2
System.out.println(Math.max(q,r)); // 6
System.out.println(Math.max(p,s)); // 5.0 ← beware!!!
```

\*\*\* You can input integers and doubles,  
Math.min(x) and Math.max(x) will  
output either doubles only (most precise!) \*\*\*

Oct 1-5:41 PM

## JAVA Concept: Random # Generator (0-0.99...)

Math.random();

```
double u=Math.random();
System.out.println(u); //u=0.5017
int v = (int)(u+0.5); //v=1
System.out.println(v); //0 or 1 (yes or no)
int w = (int)((u*6)+1); //0-5.99..., 1-6.99, 1-6
System.out.println(w); //w=4
```

\*\*\* Math.random() will output,  
a double # that is 0-0.99... \*\*\*

Oct 1-5:41 PM

## Math.rand( ) ... this is huge for programs!

What if we were creating a game that needed a  
6-sided die? When the die is rolled, we need a  
number between 1 and 6.

```
double dieRoll = Math.random(); //rand 0-0.999...
dieRoll*=6; //rand 0-5.999...
dieRoll+=1; //rand 1-6.999...
int roll = (int)dieRoll; //rand 1-6
```

Why take so many lines???

```
double dieRoll = Math.random()*6+1; //rand 1-6.999...
int outcome = (int)dieRoll; //rand 1-6
```

Oct 2-5:55 AM

## JAVA Concept: Round a number

Math.round();

```
int x=3;
double y=3.34, z=3.95;
System.out.println(Math.round(x)); //3
System.out.println(Math.round(y)); //3
System.out.println(Math.round(z)); //4
System.out.println(Math.round(-4.59)); //-5
```

\*\*\* Math.round() will output  
an integer (technically a "long") \*\*\*

Oct 1-5:42 PM

## Summary of Math Methods ...

| <u>Ii</u>                 | <u>Id</u>      | <u>Oi</u> | <u>Od</u> |
|---------------------------|----------------|-----------|-----------|
| Absolute Value            | Math.abs(x);   | x         | x         |
| Exponents or Powers       | Math.pow(x,y); | x         | x         |
| Square Root               | Math.sqrt(x);  | x         | x         |
| Greatest Integer Function | Math.floor(x); | x         | x         |
| Round Up                  | Math.ceil(x);  | x         | x         |
| Comparison Test           | Math.min(x,y); | x         | x         |
| Comparison Test           | Math.max(x,y); | x         | x         |
| Random # (0-0.99...)      | Math.random(); |           | x         |
| Round a number            | Math.round(x); | x         | x         |
| Pi                        | Math.PI;       |           | x         |

\*\*\* This isn't really a method ... it is a final Math variable \*\*\*

Oct 1-5:44 PM

Some practice problems ...

```
Math.round(7.2)           // 7
Math.random( ) + 3        // # 3-3.999...
Math.min(7,8)             // 7
Math.round(21%12+0.52)    // 10
(int)(Math.random( ) * 5) // # 0-4.999...
Math.max(8/5.0, Math.ceil(1.2)) // 2.0
Math.min(Math.abs(-9), Math.pow(2,3)) // 8.0
```

Oct 1-5:44 PM

Checklist for today ...

*There are many other math  
methods, independent study*

- ☐ Understand today's lesson
- ☐ Complete Unit 1 Worksheet 03
- ☐ Enter Worksheet Answers in Moodle  
(counts as a grade, retake once)

Sep 28-9:44 AM