

Reference Sheet

Method	Description
<code>Math.round(x)</code>	Will round the value of the input <code>Math.round(5.782)</code> would return 6.0
<code>Math.abs(x)</code>	Will take the absolute value of the input <code>Math.abs(-7)</code> would return 7.0
<code>Math.max(x , y)</code>	Will take two inputs and return the larger of the two <code>Math.max(8 , 10)</code> would return 10.0
<code>Math.min(x , y)</code>	Will take two inputs and return the smaller of the two <code>Math.min(8 , 10)</code> would return 8.0
<code>Math.pow(x , y)</code>	Will take the first input and raise it to the power of the second input <code>Math.pow(5 , 2)</code> would return 25.0
<code>Math.sqrt(x)</code>	Will take the square root of the input <code>Math.sqrt(49)</code> would return 7.0
<code>Math.random()</code>	No input needed, will return a double greater than or equal to 0 and less than 1. [0,1) <code>Math.random()</code> could return 0.7856

- If you have a computer and internet access at home, you can go to BlueJ.org to download a free copy of BlueJ just like we've used in the classroom.

Casting

Casting can be used to convert one datatype into another compatible datatype.

For example:

```
double myDouble = 5.72;
int myInt = (int) myDouble;    // takes the double (5.72) and truncates it to be 5
```

Math.random()

The code below shows how to generate a random number between 1 and 100.

```
Math.random( )    // generates [0,1)
100*Math.random( )    // generates [0,100)
100*Math.random( ) + 1    // generates [1,101)
(int)(100*Math.random( ) + 1)    // generates [1,101) then truncates the decimal, leaving the
                                // integers 1 to 100
```

Packet #6

```
1 public class MathPractice
2 {
3     public static void main(String[] args)
4     {
5         int a = 7;
6         int b = 5;
7         double num1 = Math.min(a, b);
8         double num2 = Math.max(-a, b);
9         double num3 = Math.abs(a);
10        double num4 = Math.abs(-a);
11    }
12 }
```

Use the code segment above to answer the following questions.

- 1) What would the following method print?
System.out.println(num1);
- 2) What would the following method print?
System.out.println(num2);
- 3) What would the following method print?
System.out.println(num3);
- 4) What would the following method print?
System.out.println(num4);
- 5) What would the following method return?
Math.round(num1/num3);
- 6) What would the following method return?
Math.round(num4/num1);
- 7) Write a method that will take num2 and raise it to the second power.
- 8) Write a method that will round the value of (a) multiplied by 3 and divided by 2.

```
1 public class MathPractice2
2 {
3     public static void main(String[] args)
4     {
5         int a = 2;
6         int b = 5;
7         double c = 3.14;
8         double d = 2.78;
9         double num1 = Math.pow(b, 2);
10        double num2 = Math.pow(a, 3);
11        double num3 = Math.sqrt(num1);
12        double num4 = Math.sqrt(num2);
13        long num5 = Math.round(c);
14        long num6 = Math.round(d);
15    }
16 }
```

Use the code segment above to answer the following questions.

- 1) What would the following method print?
System.out.println(num1);
- 2) What would the following method print?
System.out.println(num2);
- 3) What would the following method print?
System.out.println(num3);
- 4) What would the following method print?
System.out.println(num4);
- 5) What would the following method print?
System.out.println(num5);
- 6) What would the following method print?
System.out.println(num6);
- 7) Write a method for returning the maximum value of num2 and num5.
- 8) What would the method from question 7 return?

Packet #8

Refer to the reference sheet provided to help answer the questions below.

- 1) Which use of `Math.random()` below would cause an error message? Explain
 - a) `int num = Math.random()`
 - b) `double num = Math.random()`

- 2) Which code will generate a random integer between 1 and 10?
 - a) `Math.random(1, 10)`
 - b) `1 * Math.random() + 10`
 - c) `10 * Math.random() + 1`
 - d) `(int)(1 * Math.random() + 10)`

- 3) `Math.random()` generates number from 0 to 1. Which of these values is excluded as a possible value?

- 4) `10 * Math.random() + 5` will generate numbers in the range of $[5 , 15)$. What is the range for `5 * Math.random() + 10`?

- 5) Use `Math.random()` to write a line of code that would generate numbers in the ranges below.
 - a) $[1 , 100)$
 - b) $[20 , 50)$
 - c) $[-10 , 0)$
 - d) $[50 , 200)$

Packet #9

The code written below is a class that will generate a random number between 1 and 1000, and then cast it into an integer. Write conditionals (if-statements) to do the following.

If score is more than 800, print "New High Score"

If score is between 500 and 799, print "Nice Job"

If score is between 1 and 499, print "Try again"

```
public class Packet9
```

```
{
```

```
    public static void main (String [ ] args)
```

```
    {
```

```
        int score = (int)( 1000 * Math.random( ) + 1 );
```

```
    }
```

```
}
```

Packet #10

Finish writing the class below. It should check to see if variables a, b, and c make a Pythagorean Triple. Remember, the Pythagorean Theorem is $a^2 + b^2 = c^2$.

*Hint: a = 3, b = 4, and c = 5 should print "Yes, that's a Pythagorean Triple."

*Hint: a = 3, b = 4, and c = 10 should print "No, those numbers are not a Pythagorean Triple."

```
public class Packet10
{
    public static void main (String[ ] args)
    {
        int a = 3;
        int b = 4;
        int c = 5;
        if ( //replace with testing the numbers for a Pythagorean Triple )
        {
            //replace with print command
        }
        else
        {
            //replace with print command
        }
    }
}
```