Name _____ Period_____

1. Consider the code below. Predict the result of each of the following numeric operations

```
double d1 = 3.0;
double d2 = 10.5;
int i1 = 12;
int i2 = 18;
```

(a) 2 * (i1 / i2) + 1

(b) 2 * ((double)i1 / i2) + 1

(c) 15 – i1 * (d1 * 3) + 4

(d) 15 – i1 * ((int)d2 * 3) + 4

/4

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2. Refer to the Java Math Class Methods at the end of this exam. Indicate what is printed for each of the following. If an error occurs, indicate the error and provide an explanation

Code	Output (If an error occurs, write "error" and provide an explanation)

`int x = 100;`
`int y = 200;`
`double z = Math.min(x, y);`
`System.out.println(z);`	

`double a = 2;`
`double b = 4;`
`int c = Math.max(a, b);`
`System.out.println(c);`	

`int x = 100;`
`int y = 200;`
`int d = Math.pow(x, y);`
`System.out.println(d);`	

`int b = 11111111;`
`int count = 0;`
`double num = b%10*Math.pow(2,count);`
`System.out.println((int)num);`	

`int s = Math.sqrt(4);` `System.out.println(s);`	
`int c = Math.ceil(-155.6);` `System.out.println(c);`	
`double f = Math.floor(-0.50);` `System.out.println(f);`	
`int r = Math.random();` `System.out.println(r);`	
`double r = Math.ceil(Math.random());` `System.out.println(r);`	
`int r = Math.floor(Math.random()+100);` `System.out.println(r);`	
	/10

Score _____/20

3. A `RandomNumber` class below accepts a positive integer from the user and assigns this value to a variable called max. It then creates a random number within a range that spans the negative value of the `max` (inclusive) and the positive value (not inclusive) and prints the result to the console. Consider the following examples,

Run	Output
`Java RandomNumber 10`	`8`
`Java RandomNumber 5`	`-3`
`Java RandomNumber 8`	`0`
`Java RandomNumber 11`	`11`

Complete the `RandomNumber` class below.

```
public class RandomNumber{
     public static void main(String args[]){
          int max = args[0];









}
```

/5

Score _____/20

4. A `BinaryToDecimal` class below accepts a 3-digit positive binary integer from the user and assigns this value to a variable called `bin`. It then converts the number to its decimal equivalent and stores the result in a variable called `dec`. Consider the following examples,

Run	value of dec
`Java BinaryToDecimal 011`	3
`Java BinaryToDecimal 101`	5
`Java BinaryToDecimal 111`	7
`Java BinaryToDecimal 010`	2

Complete the `BinaryToDecimal` class below.

```
public class BinaryToDecimal{
     public static void main(String args[]){
          int bin = args[0];









}
```

/5

Score _____/20

Method	Declaration	Purpose
Basic Math Methods (Functions):		
Math.abs(x)	int abs (int x)	returns the absolute value of an integer. Also available for work with *double* or *float*.
Math.ceil(x)	double ceil (double x)	rounds up to a whole number. ceil (11.2) rounds to 12.0 (*not normal rounding*)
Math.floor(x)	double floor (double x)	rounds down to a whole number. floor(11.5) rounds to 11.0 (*not normal rounding*)
Math.hypot(a,b)	double hypot (double a, double b)	calculates the hypotenuse (*c*) of a right triangle where *a* and *b* are the legs.
Math.max(a,b)	int max (int a, int b)	returns the greater of the two integers passed. Also available for work with *double* or *float*.
Math.min(a,b)	int min (int a, int b)	returns the lesser of the two integers passed. Also available for work with *double* or *float*.
Math.PI	double PI ()	returns a value close to the actual mathematical π
Math.pow(x,y) *(exponent)*	double pow (double x, double y)	calculates *x* to the power of *y*. If *x* is negative, *y* must be an integer. If *x* is zero, *y* must be a positive integer.
Math.random(x) *(read more here)*	double random (double x)	returns a random floating point number between 0 and 1.
Math.round(x)	double round (double x)	rounds a double to the nearest integral using normal math rounding (either up or down).
Math.sqrt(x)	double sqrt (double x)	calculates the positive square root of *x*. (*x* is >= 0)
Exponential and Logarithmic Methods:		
Math.exp(x)	double exp (double x)	returns *e* raised to the power of *x* where *e* is Euler's *e* = 2.71828...
Math.log(x)	double log (double x)	returns the natural logarithm of *x,* base *e*
Math.log10(x)	double log10 (double x)	returns the logarithm of *x*, base 10
Trigonometric Methods: All work in **radians** rather than degrees.		
Math.cos(x)	double cos (double x)	returns the cosine of *x* in radians
Math.sin(x)	double sin (double x)	returns the sine of *x* in radians

Score _____/20

Math.tan(x)	double tan (double x)	returns the tangent of *x* in radians
Math.acos(x)	double acos (double x) (x is between 1 and -1)	returns the arc cosine of *x* (the angle whose cosine is *x*)
Math.asin(x)	double asin (double x) (x is between 1 and -1)	returns the arc sine of *x* (the angle whose sine is *x*)
Math.atan(x)	double atan (double x)	returns the arc tangent of *x* (the angle whose tangent is *x*)
Math.atan2(y,x)	double atan2 (double y, double x)	converts rectangular coordinates (*y, x*) to polar coordinates (*r*, theta)
Math.toDegrees (double angrad)	double toDegrees (double a)	converts an angle in radians to degrees
Math.toRadians (double angdeg)	double toRadians (double a)	converts an angle in degrees to radians

Score _____/20