

Math Library Functions (ICSE Class 9)

Math Library belongs to java.lang package. This package “java.lang” is always invoked by default in JAVA, we don’t need to import it like scanner class as it is already present in every program

All the functions of Math Library are static functions, so we do not need object of Math class. we can call its functions directly using the class name Math

Operation	Function	Return type	example
Square Root	Math.sqrt(n)	double	double a= Math.sqrt(49); a will store 7.0
Cube root	Math.cbrt(n)	double	double a= Math.cbrt(125); a will store 5.0
Power b ^e	Math.pow(b,e)	double	double a= Math.pow(5,2); a will store 25.0
Maximum between two	Math.max(a,b)	depends on parameter	int m= Math.max(10, 5); m will store 10 double n=Math.max(10.0, 5.0); n will store 10.0
Minimum between two	Math.min(a,b)	depends on parameter	int m= Math.min(10, 5); m will store 5 double n=Math.min(10.0, 5.0); n will store 5.0
Absolute Value (positive value) a	Math.abs(a)	depends on parameter	double a= Math.abs(-2.0); a will store 2.0
Round Off (nearest whole number)	Math.round(r)	returns int if parameter is float returns long if parameter is double	int a= Math.round(4.7); a will store 5 int b= Math.round(4.2); b will store 4 int c= Math.sqrt(4.5); c will store 5
Ceiling Value (Nearest Higher Integer)	Math.ceil(a)	double	double k=Math.ceil(2.3); k will store 3.0
floor value (Nearest Lower Integer)	Math.floor(a)	double	double k=Math.floor(4.8); k will store 4.0;
rint (behaves like round off, but at mid point (.5) it chooses the even side)	Math.rint(n)	double	double k=Math.rint(4.7); k will store 5.0 double m=Math.rint(4.2); m will store 4.0 double n= Math.rint(4.5); n will store 4.0 double mn=Math.rint(5.5); mn will store 6.0

exponent (returns e^n)	<code>Math.exp(n)</code>	double	<code>double a= Math.exp(5);</code> a will store e^5
Natural Logarithm ($\log_e a$)	<code>Math.log(a)</code>	double	<code>double k= Math.log(5);</code> k will store $\log_e 5$
random value gives x where $0 \leq x < 1$	<code>Math.random()</code>	double	<code>double p=Math.random();</code> p will store a random value between 0 and 1 (1 is excluded)

Constants:

Mathematical Constant	Math Library Constant in JAVA	Description	example
π	<code>Math.PI</code>	Gives value of PI : 3.14159265359	<code>double k =Math. PI;</code> k will store value of π
e	<code>Math.E</code>	Gives value of e : 2.71828	<code>double k= Math.E;</code> k will store value of e (Euler's number)

Remember : $\sqrt{x}$ is same as $x^{1/2}$

To write $\sqrt{b^2 - 4ac}$

we can write it as: `double k= Math.sqrt (b*b – 4*a*c);`

or `double k = Math.pow((b*b-4*a*c) , 1.0/2.0);`

`Math.pow(36,1/2)` will return 1.0 and `Math.pow(36, 1.0/2.0)` will return 6.0

Nesting of functions:

To find maximum between a,b and c

`int maximum = Math.max(Math.max(a,b),c);`

`| x |` means absolute value of x

** There are other functions in Math library. For now, we need these only.

*** All the functions that return double value, they must be stored in a double variable. storing them directly in float will cause an error. Although we can type cast them to store in a different type.