MATH / TRIGONOMETRIC FUNCTIONS

MATH FUNCTIONS

The Arduino Math library (math.h) includes a number of useful mathematical functions for manipulating floating-point numbers.

EXAMPLE

```
double double__x = 45.45 ;
double double__y = 30.20 ;

void setup() {
    Serial.begin(9600);
    Serial.print("cos num = ");
    Serial.println (cos (double__x) ); // returns cosine of x
    Serial.print("absolute value of num = ");
    Serial.println (fabs (double__x) ); // absolute value of a float
    Serial.print("floating point modulo = ");
    Serial.println (fmod (double__x, double__y)); // floating point modulo
    Serial.print("sine of num = ");
    Serial.println (sin (double__x) ) ;// returns sine of x
    Serial.print("square root of num : ");
    Serial.println ( sqrt (double__x) );// returns square root of x
    Serial.print("tangent of num : ");
    Serial.println ( tan (double__x) ); // returns tangent of x
    Serial.print("exponential value of num : ");
    Serial.println ( exp (double__x) ); // function returns the exponential value of x.
    Serial.print("cos num : ");

    Serial.println (atan (double__x) ); // arc tangent of x
    Serial.print("tangent of num : ");
    Serial.println (atan2 (double__y, double__x) );// arc tangent of y/x
    Serial.print("arc tangent of num : ");
    Serial.println (log (double__x) ) ; // natural logarithm of x
    Serial.print("cos num : ");
    Serial.println ( log10 (double__x)); // logarithm of x to base 10.
    Serial.print("logarithm of num to base 10 : ");
    Serial.println (pow (double__x, double__y) );// x to power of y
    Serial.print("power of num : ");
    Serial.println (square (double__x)); // square of x
}
```

RESULT

cos num = 0.10
absolute value of num = 45.45
floating point modulo =15.25
sine of num = 0.99
square root of num : 6.74
tangent of num : 9.67
exponential value of num : ovf
cos num : 1.55
tangent of num : 0.59
arc tangent of num : 3.82
cos num : 1.66
logarithm of num to base 10 : inf
power of num : 2065.70

TRIGONOMETRIC FUNCTIONS

You need to use Trigonometry practically like calculating the distance for moving object or angular speed. Arduino provides traditional trigonometric functions (sin, cos, tan, asin, acos, atan) that can be summarized by writing their prototypes. Math.h contains the trigonometry function's prototype.

SYNTAX

double sin(double x); //returns sine of x radians
double cos(double y); //returns cosine of y radians
double tan(double x); //returns the tangent of x radians
double acos(double x); //returns A, the angle corresponding to cos (A) = x
double asin(double x); //returns A, the angle corresponding to sin (A) = x
double atan(double x); //returns A, the angle corresponding to tan (A) = x

EXAMPLE

```
double sine = sin(2); // approximately 0.90929737091
double cosine = cos(2); // approximately -0.41614685058
double tangent = tan(2); // approximately -2.18503975868
```