

# Computer Science & Engineering 150A

## Problem Solving Using Computers – Laboratory

### Lecture 04 - Math Functions

Shuai Xie

(Adapted from Derrick Stolee, Lin Liu & Shuai Xie )

Spring 2010

# Review: printf, varial data type

CSCE150A

Review

Basic tools

Math  
Functions

```
gcc -o hi hello.c  
./hi
```

```
printf("format string", variable list);
```

Placeholder	Variable Type
%d	int
%f	double
%c	char

`%.10f`—output 10 digits after the decimal point.

# Preview-Input: scanf

CSCE150A

Review

Basic tools

Math  
Functions

- `scanf("format string", &variables...);`
  - Use the same as `printf`, except for `&` before variables.

```
scanf("%d %lf", &myInt, &myDouble);
```

- Be sure to define variables ahead of time!
- Remember to keep the same format string when input.

Placeholder	Variable Type
<code>%d</code>	<code>int</code>
<code>%lf</code>	<code>double</code>
<code>%c</code>	<code>char</code>

Tab key -- to complete a partially typed filename.

ArrowUp key -- to find the previously inputted command.

Paste source code -- copy in browser, right click in pico.

Ctrl & c -- to stop current command.

- = Set a value

```
int myVariable = 50;
```

- + , - , \* , /

```
a = b + c;    a = b - c;
```

```
a = b * c;    a = b / c;
```

- % Remainder

```
remain = E % F;
```

Be careful of rounding! When in doubt, use doubles.  
Or, use 25.0, -1.0, (add .0) when using integer literals

Math Expression	C Code
$\frac{ab}{1-c}$	<code>(a * b) / (1 - c)</code>
$x^2 + 2y + 1$	<code>x * x + 2 * y + 1</code>

– Watch order of operations!

`abs(x)``fabs(x)``sin(x)``cos(x)``pow(x,y)``sqrt(x)``ceil(x)``floor(x)`

- `#include <math.h>`
- `gcc -lm -o pow pow.c`
- 
- On Page:121 of the Textbook

Math Expression

C Code

$$3 \sin(x - 1)$$

`3.0 * sin(x-1)`

$$\left| \frac{1}{\sqrt{1-x^2}} \right|$$

`fabs(1.0/sqrt(1-pow(x,2)))`