A function is a group of statements that together perform a task. In MATLAB, functions are defined in separate files. The name of the file and of the function should be the same.

Syntax of a function statement is

```
function [output1,out2, ..., outN] = name- Function(argument)
End
```

Example

create function named *mymax* to be written in a file named *mymax.m*. It takes vector of numbers as argument and returns the maximum of the numbers.

***f(x) is function has one argument(x)**

f(x,y,..)is function has more one argument

Editor - C:\Users\layth\Documents\MATLAB\mymax2.m*

+5 | mysolve.m | simple_ode.m | mymax2.m* | myfact.m | mysincos.m

```
1     %s is output & z is input argument
2     function s=mymax2(x)
3 -   if ~isvector(x)
4 -       error('must be vector yaaini');
5 -   end
6 -   s=max(x);
7
8 -   end
```

argument

name Function

Command Window

New to MATLAB? See resources for Getting Started.

```
>> x

x =

     1     2     3     4     5     6     7     8     9    10

>> mymax2(x)
```

call function in command windows

Editor - C:\Users\layth\Documents\MATLAB\myx.m*

+5 | mysolve.m | simple_ode.m | mymax2.m | myfact.m

```
1   function [f] = myx(x,y)
2   if(x>y)
3       f=x+y;
4   elseif (x==y)
5       f=sin(x)^2+cos(x)^2;
6   else
7       f=y+2*x;
8   end
9
```

Command Window

New to MATLAB? See resources for Getting Started.

```
>> x=10

x =

     10

>> y=20

y =

     20

>> myx(x,y)
```

call function myx and pass x,y

Basic Arithmetic

+	Addition
-	Subtraction
.*	Multiplication
*	Matrix Multiplication
./ .\	Right array Division Left array Division
.^	Element-wise power
^	Matrix power

Math expression

Math expression	matlab expression
$W=A+3AB+B^2$	s=(A^2+B^2)/(B*C)
$S=(A^2+B^2)/(Bc)$	v=s*sqrt(w^2+A^2)
$V=s\sqrt{W^2+A^2}$	x=t-t^3+t^5
$X=t-t^3+t^5$	Y=sin(t)^2-tan(t)
$Y=\sin^2 t-\tan(t)$	Z=exp(2*t-t)+t
$Z=(e^{2t-t})+t$	asin(x)+atan(y)
$\sin^{-1}(x)+\tan^{-1}(y)$	log(x)
$Ln(x)$	

H.W

Calculate the molecular weight of the following gases mixture with their partial weights

%m=[co_2,co,c_4,H_2]

f=m(1)*w(1)+m(2)*w(2)+…..

M =44,28,16.04,2.02;

W= 0.2,0.3,0.4,0.1

H.W

Calculate the following function by Matlab using function

3! IS FACTORIAL FUNCTION 1*2*3

$$e = 1 + 1/2! + 1/3! + 1/4! + 1/5!$$

Solve the following in matlab using f(a,b,c)

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Trigonometric functions are measured in radian degrees,
Grading degrees, can be done in two ways:
First: - By adding the letter d after any function, for example, we write the sin() function as sind().
Second: - Multiply the angle by the amount (pi / 180) as in the following

```
>> sin(30*(pi/180))
```

Math Functions in matlab

cos(x) Cosine
sin(x) Sine
tan(x) Tangent
acos(x) Arc cosine
asin(x) Arc sine
atan(x) Arc tangent
Sec(x)or 1/cos
Csc(x) or 1/sin
exp(x) Exponential
sqrt(x) Square root
log(x) Natural logarithm
log10(x) Common logarithm

abs(x) Absolute value
mod(x) Modulus after division
max(x) Maximum value
min(x) Minimum value
ceil(x) Round towards + ∞
floor(x) Round towards -∞
round(x) Round to nearest integer
rem(x) Remainder after division
angle(x) Phase angle
Fix(x)
pow2(x)

```
>> sind(30)

ans =

    0.5000

>> p=1/sind(30)

p =

    2.0000

>> cscd(30)

ans =

    2.0000

>> 1/0.5000

ans =

     2
```

Mod

n=floor(x./y)

x - (n.*y)

vs

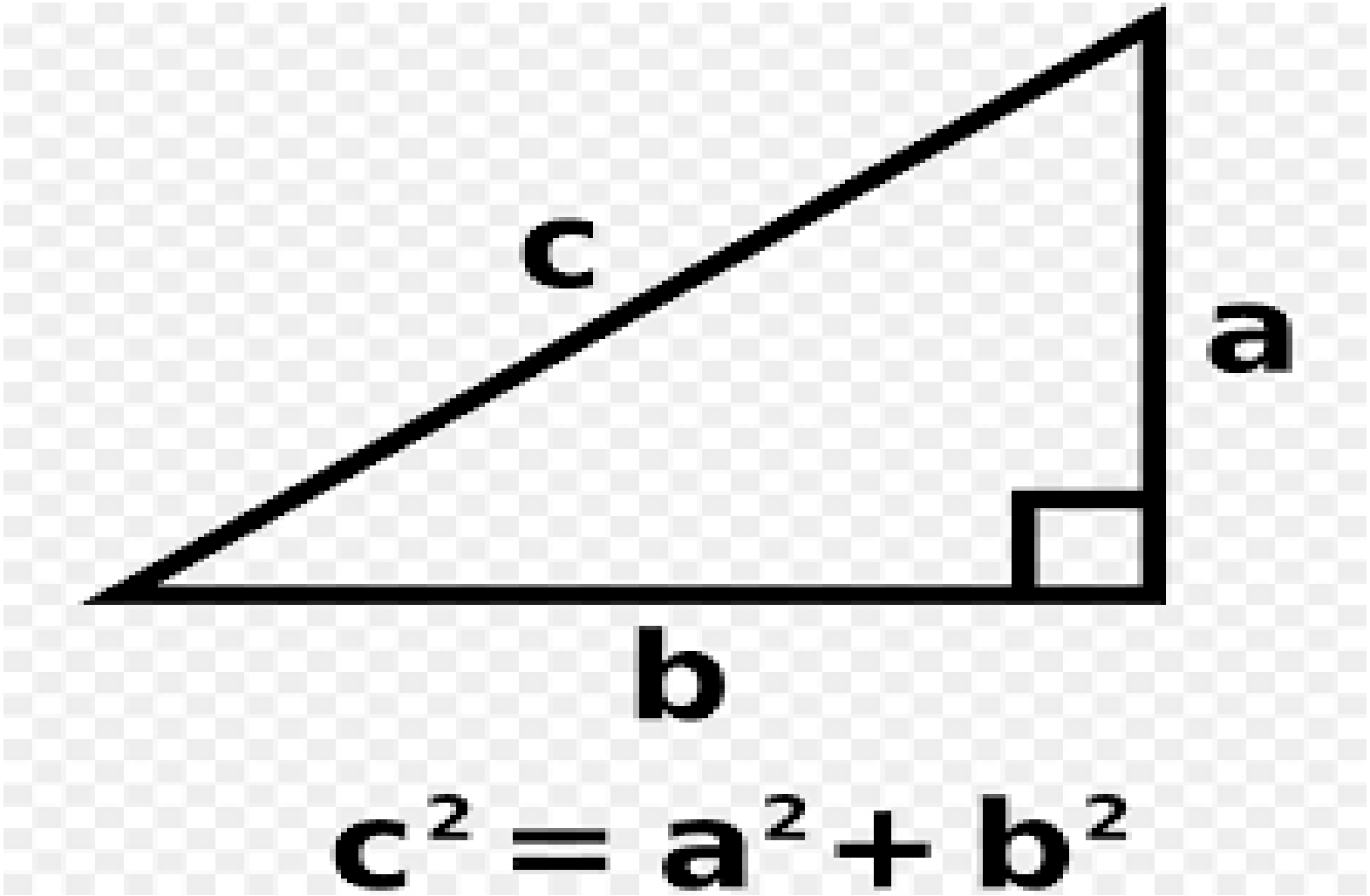
Rem

n=fix(x./y)

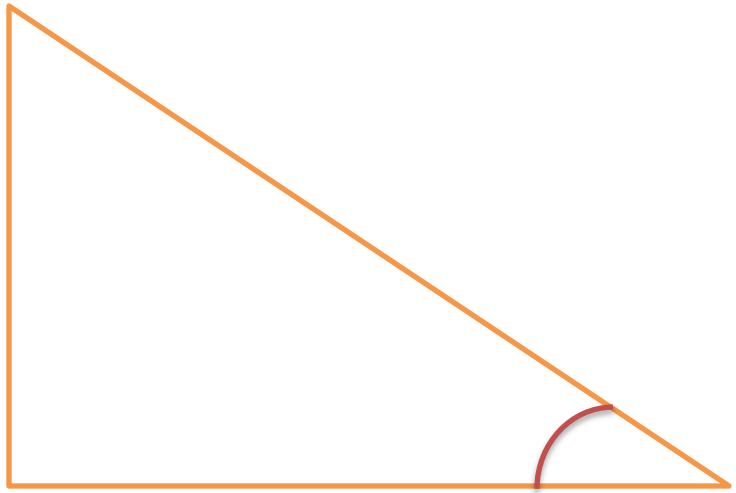
x - (n.*y)

Use (-5,2)

Pythagorean theorem



Problem 1



(4,3)

Prove :-

$$\sin^2(x)+\cos^2(x)=1$$

Ex:-Write MATLAB program to calculate the following:-

1-Real part

2-Imaging part

3-Absolute Value

4-Angle phase for complex number

C = 5 $\sqrt{-9}$+ 13