**Exercise1:**

Type the following expressions in the Matlab Command Window to see what kind of vectors they create. Write

the resulting vectors (and answer the questions) on the blanks.

a= zeros(1,4)

a = 0 0 0 0

b= zeros(4,1)

b =

0

0

0

0

c= ones(1,3)

c = 1 1 1

d= 10:2:17

d = 10 12 14 16

e= 10:-1:17

e = Empty matrix: 1-by-0

f= [10 20 40]

f = 10 20 40

g= [10,20,40]

g = 10 20 40

h= [10;20;40]

h =

10

20

40

m= [a g]

m = 0 0 0 0 10 20 40

n= [b; k]

??? Undefined function or variable 'k'.

q= b'

q = 0 0 0 0

r= [a b’]

r = 0 0 0 0 0 0 0 0

**Exercise2:**

Write the MATLAB commands to define the following matrices.

a. 

G=[1:2:5;2:2:6]

b. 

F=[0:0.2:100]

**Exercise 3:**

Given the following matrix, show the results generated by these MATLAB commands.

**v = [3.7 2.4 0.3 5.2 4.8]**

a. **h = find(v>3.5)**

h = 1 4 5

b. **high = v(h)**

high =3.7000 5.2000 4.8000

**Exercise4:**

(a)What is the output from executing the following script? If the program doesn’t terminate or if there will be an error during execution, write the word “error” instead of the output.

**Output:  
3 3 3 5**

v= [4 2 3 5];

for k= 1:length(v)

v(k) = v(v(k)-1);

end

disp(v)

(b)What will be printed when the following script and function are executed? Use the specified print format.

|  |  |
| --- | --- |
| ***Script*** | ***Function*** |
| a = 1; b = 4; c = 7;  d = blah(c,b);  fprintf(‘a is %d\n’, a);  fprintf(‘b is %d\n’, b);  fprintf(‘d is %d\n’, d); | function a = blah(b,c)  b = b + c;  a = b;  fprintf(’c is %d\n’, c); |

**Output:  
  
c is 4  
a is 1  
b is 4  
d is 11**

**Exercise5:**

(a)Write a script that calculates the function **f(x)= cos(4\*x)+cos(4.1\*x)** and use it to plot f(x) from x=1 to 10

function r = f(x)

r=cos(4 .\* x)+cos(4.1 .\* x)

end

///////////////////////////////////////////

x=1:10  
plot(x,f(x))

(b) Write a function y = Mid3(a,b,c) that returns the middle of the three values a, b, and c.

function y = Mid3(a,b,c)

M=[a,b,c];

M=sort(M);

y=M(2);

end

///////////////////////////////////////////

y=Mid3(5,1,6)

(c) Complete the following function so that it performs as specified:

function x = IsPythag(a,b,c)

% x has the value of 1 if a triangle with sides a, b, and c is

% a Pythagorean triangle and 0 otherwise.

% a, b, and c are positive integers.

function x = IsPythag(a,b,c)

if a^2 + b^2 == c^2

x=1;

elseif a^2 + c^2 == b^2

x=1;

elseif b^2 + c^2 == a^2

x=1;

else

x=0;

end

end

**///////////////////////////////////////////////////////////////////////////////////////////////////////**

y=IsPythag(3,4,5)

(d) Write a function called ‘check1’ that takes a vector as input and prints an error message for all vectors that do not have exactly three components.

Function check1(a)

if size(a)~= 3

fprintf('The vector hasnt got 3 components.');

else

fprintf('The vector has got 3 components.');

end

end

**///////////////////////////////////////////////////////////////////////////////////////////////////////**

check1([1 2 3 4])

(e) Write a MATLAB **function** that accepts time ***t*** as an input and returns a voltage corresponding to the following equation: *v* = e-*t*sin(5*t*).

function x= calculate(t)

x= exp(-t)\*sin(5\*t);

end

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calculate(pi)