

Midterm Revision:

Q1 –

Use Matlab array operations to:

Add 1 to each element of the vector [2 3 -1]

[2 3 -1]+1

multiply each element of the vector [1 4 8] by 3

[1 4 8]*3

Find the array product of the vectors [1 2 3] and [0 -1 1]

[1 2 3].*[0 -1 1]

Square each element of the vector [2 3 1]

[2 3 1].^2

Q2 -

Write a Matlab m-file to convert temperature from Celsius to Fahrenheit with the formula:

$F = 9C/5 + 32$

```
C = input('Enter temperature in Celsius: ');
```

```
F = 9*C/5 + 32;
```

```
disp(['Temperature in fahrenheit:', num2str(F), 'F']);
```

Q3 -

Write a script which inputs any two numbers (which may be equal) and displays the larger one with a suitable message, or if they are equal, displays a message to that effect

```
x = input('first number: ');
```

```
y = input('second number: ');
```

```
if (x>y)
```

```
    disp(['larger is:', num2str(x)])
```

```
elseif (y>x)
```

```
    disp(['larger is:', num2str(y)])
```

```
else
```

```
    disp('Equal numbers')
```

```
end
```

Q4 -

There are 39.37 inches in a meter,

12 inches in a foot, and 3 feet in a yard. Write a script to input

a length in meters and convert it to yards, feet and inches.

```
m = input('Enter length in meters');
```

```
i = m * 39.37;
```

```
f = i / 12;
```

```
y = f / 3;
```

```
disp(i);
```

```
disp(['length in inches', num2str(i)]);
```

```
disp(f);
```

```
disp(['length in feet', num2str(f)]);  
disp(y);  
disp(['length in yards', num2str(y)]);
```

```
disp([m y f i]);
```

Q5 -

Translate into Matlab statements:

add 1 to value of i and store the result in i
 $i = i + 1;$

cube i add j to this store the result in i
 $i = i^3 + j;$

set g to the larger of the two variables e and f
 $g = \max(e, f);$

if d is greater than zero set x equal to minus b.

```
if (d>0)  
    x = -b;  
end
```

Q6 -

```
C = 0:10:100;  
F = 9*C/5 + 32;  
disp(' C F');  
disp(' -----');  
disp([C' F']);
```

Q7 - Random integer numbers between 40 , 100

```
floor(60*rand(1,10))+40
```

```
-----  
rand --> (0,1)    3*rand --> (0,3) floor(3*rand) --> {0,1,2}  
                  floor(3*rand)+1 --> {1,2,3}
```

Q8 -

```
x = 0:10:360;  
f1 = sin(x*pi/180);  
f2 = cos(x*pi/180);  
plot(x,f1,x,f2);
```

Q9 -

Quadratic Equation: $ax^2 + bx + c = 0$

format compact

```
a = input('a = ');
b = input('b = ');
c = input('c = ');
if (a==0 && b==0 && c==0)
    disp(' Solution is indeterminate ')
elseif (a==0 && b==0)
    disp(' There is no solution ')
elseif a==0
    x = -c/b;
    disp(' Only one root: equation is linear.')
    disp(x);
elseif (b^2-4*a*c < 0)
    disp('complex roots');
elseif (b^2-4*a*c == 0)
    x = -b/(2*a);
    disp('equal roots');
    disp(x);
else
    x1= (-b - sqrt(b^2-4*a*c))/(2*a);
    x2= (-b + sqrt(b^2-4*a*c))/(2*a);
    disp(' x1,x2 the two distinct roots');
    disp([x1 x2]);
end
```