

```
% Name: Saleh Al Alsheikh
% KSU ID: 445102564
% Date: 24/2/2026
% clear;
% clc;
format short g
```

```
% Question 1
```

```
alpha = [27 22.5 18 13.5 9 4.5]
```

```
alpha = 1×6
    27    22.5    18    13.5     9     4.5
```

```
beta = [2.8 4.5 6.8 9.7 13.2 17.3]
```

```
beta = 1×6
    2.8     4.5     6.8     9.7    13.2    17.3
```

```
n = length(alpha)
```

```
n =
     6
```

```
S1 = sum(alpha)
```

```
S1 =
    94.5
```

```
S2 = sum(alpha.^2)
```

```
S2 =
   1842.8
```

```
S3 = sum(alpha.^3)
```

```
S3 =
   40186
```

```
S4 = sum(alpha.^4)
```

```
S4 =
   9.3289e+05
```

```
Sb = sum(beta)
```

```
Sb =
    54.3
```

```
Sab = sum(alpha .* beta)
```

```
Sab =  
    626.85
```

```
Sa2b = sum((alpha.^2) ./ beta)
```

```
Sa2b =  
    446.6
```

```
A = [ n    S1  S2  
      S1  S2  S3  
      S2  S3  S4 ]
```

```
A = 3x3  
      6      94.5      1842.8  
     94.5     1842.8      40186  
    1842.8     40186     9.3289e+05
```

```
B = [Sb; Sab; Sa2b]
```

```
B = 3x1  
      54.3  
     626.85  
     446.6
```

```
u = A\B
```

```
u = 3x1  
    -92.361  
     17.949  
    -0.59027
```

```
x = u(1)
```

```
x =  
    -92.361
```

```
y = u(2)
```

```
y =  
     17.949
```

```
z = u(3)
```

```
z =  
    -0.59027
```

```
% Question 2
```

```
R1 = 5
```

$$R1 = 5$$

$$R2 = 8$$

$$R2 = 8$$

$$R3 = 4$$

$$R3 = 4$$

$$R4 = 6$$

$$R4 = 6$$

$$R5 = 10$$

$$R5 = 10$$

$$V1 = 12$$

$$V1 = 12$$

$$V2 = 9$$

$$V2 = 9$$

$$V3 = 6$$

$$V3 = 6$$

$$D = \begin{bmatrix} R1+R2 & -R2 & 0 \\ -R2 & R2+R3+R4 & -R4 \\ 0 & -R4 & R4+R5 \end{bmatrix}$$

$$D = 3 \times 3 \begin{bmatrix} 13 & -8 & 0 \\ -8 & 18 & -6 \\ 0 & -6 & 16 \end{bmatrix}$$

$$b = [V1; -V2; V3]$$

$$b = 3 \times 1 \begin{bmatrix} 12 \\ -9 \\ 6 \end{bmatrix}$$

$$v = D \setminus b$$

```
v = 3x1
    0.95915
    0.058615
    0.39698
```

```
I1 = v(1)
```

```
I1 =
    0.95915
```

```
I2 = v(2)
```

```
I2 =
    0.058615
```

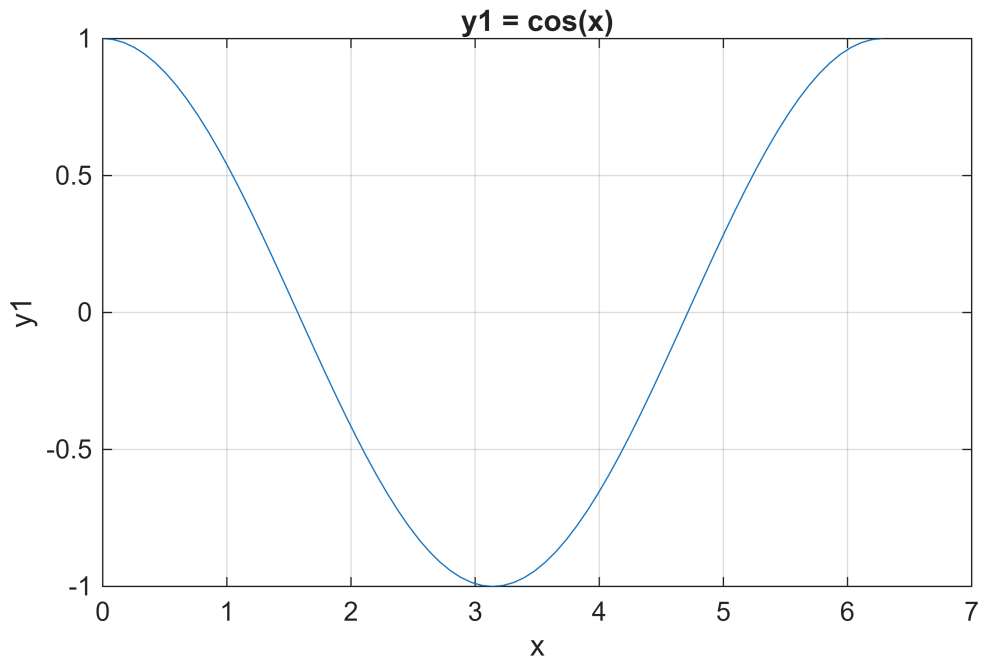
```
I3 = v(3)
```

```
I3 =
    0.39698
```

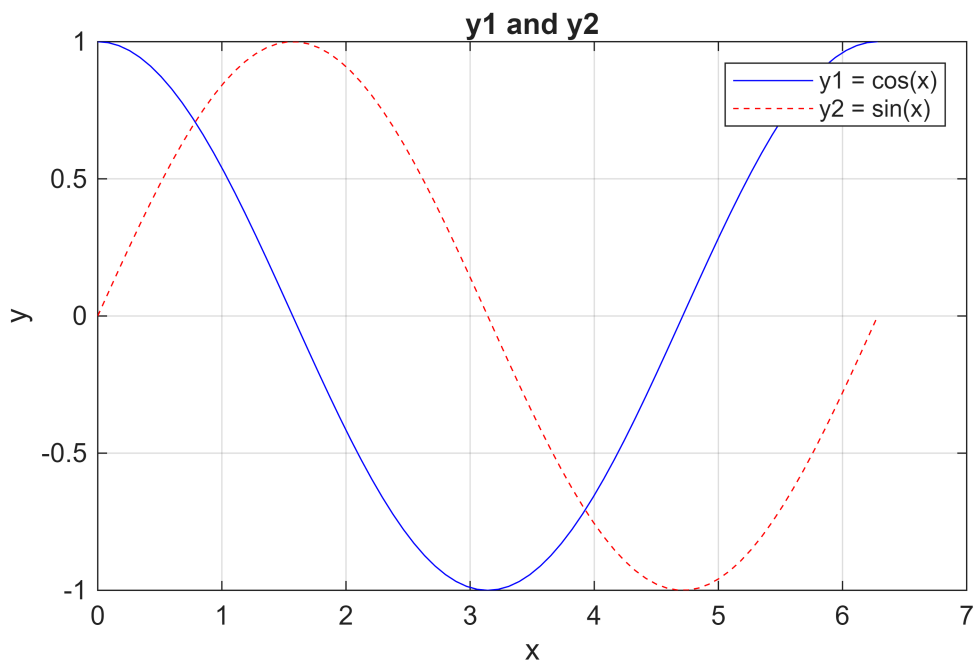
```
% Question 3
```

```
x = linspace(0,2*pi,75);
y1 = cos(x);
y2 = sin(x);
```

```
% (a)
figure
plot(x,y1)
grid on
xlabel('x')
ylabel('y1')
title('y1 = cos(x)')
```



```
% b)
figure
plot(x,y1,'b',x,y2,'r--')
grid on
xlabel('x')
ylabel('y')
title('y1 and y2')
legend('y1 = cos(x)', 'y2 = sin(x)')
```



```
% c)
figure
plot(x,y1,'k-.')
hold on
plot(x,y2,'m:o')
grid on
xlabel('x')
ylabel('y')
title('y1 and y2 with hold on')
legend('y1','y2')
```

