

SADIKU FAITH OYINDAMOLA

16/MHS03/030

CIVIL ENGINEERING

ENG 281 MID-SEMESTER TEST

a.)

(code)

```
commandwindow
clear
clc
A= [0 10 4 -2;-3 -17 1 2;1 1 1 0;8 -34 16 -10]
B= [-4;2;6;4]
x=[A^-1] *B
```

(output)

A =

```
0 10 4 -2
-3 -17 1 2
1 1 1 0
8 -34 16 -10
```

B =

```
-4
2
6
4
```

x =

```
4.0000
-0.0000
2.0000
6.0000
```

b.)

(code)

Commandwindow

```
clear
```

```
clc
```

```
syms t
```

```
d=1.5*exp(-0.75*t)*sin(0.85*t)+(0.375*t)
```

```
tn=(0.01:2.5)
```

```
dn=subs(d,tn)
```

```
figure (1)
```

```
plot (tn,dn)
```

```
xlabel ('time (hr)')
```

```
ylabel ('distance (m)')
```

```
axis tight
```

```
grid on
```

```
grid minor
```

```
v= diff(d)
```

```
vn= subs(v,tn)
```

```
figure (2)
```

```
plot (tn,vn)
```

```
xlabel ('time (hr)')
```

```
ylabel ('velocity (m/min)')
```

```
axis tight
```

```
grid on
```

```
grid minor
```

```
a=diff(v)
```

```
an= subs(a,tn)
```

```
figure (3)
```

```
plot (tn,an)
```

```
xlabel ('time (hr)')
```

```
ylabel ('acceleration (m/min^2)')
```

```
axis tight
```

```
grid on
```

```
grid minor
```

```
figure (4)
```

```
plot (tn,dn,tn,vn,tn,an)
```

```
ylabel ('variable')
```

```
xlabel ('time')
```

```
legend ('distance (m) ' 'velocity (m/min) ' 'acceleration (m/min^2)')
```

(output)

$$d = (3*t)/8 + (3*\sin((17*t)/20)*\exp(-(3*t)/4))/2$$

tn = 0.0100 1.0100 2.0100

$$dn = [ (3*\exp(-3/400)*\sin(17/2000))/2 + 3/800, (3*\exp(-303/400)*\sin(1717/2000))/2 + 303/800, \\ (3*\exp(-603/400)*\sin(3417/2000))/2 + 603/800 ]$$

$$v = (51*\cos((17*t)/20)*\exp(-(3*t)/4))/40 - (9*\sin((17*t)/20)*\exp(-(3*t)/4))/8 + 3/8$$

$$vn = [ (51*\cos(17/2000)*\exp(-3/400))/40 - (9*\exp(-3/400)*\sin(17/2000))/8 + 3/8, \\ (51*\cos(1717/2000)*\exp(-303/400))/40 - (9*\exp(-303/400)*\sin(1717/2000))/8 + 3/8, \\ (51*\cos(3417/2000)*\exp(-603/400))/40 - (9*\exp(-603/400)*\sin(3417/2000))/8 + 3/8 ]$$

$$a = - (153*\cos((17*t)/20)*\exp(-(3*t)/4))/80 - (6*\sin((17*t)/20)*\exp(-(3*t)/4))/25$$

$$an = [ - (153*\cos(17/2000)*\exp(-3/400))/80 - (6*\exp(-3/400)*\sin(17/2000))/25, - \\ (153*\cos(1717/2000)*\exp(-303/400))/80 - (6*\exp(-303/400)*\sin(1717/2000))/25, - \\ (153*\cos(3417/2000)*\exp(-603/400))/80 - (6*\exp(-603/400)*\sin(3417/2000))/25 ]$$

>>

c.)

(code)

```
commandwindow
clear
clc
syms x
y=5*sin(5*x)^5
z=pi*(y^2)
zintd=int(z,0,pi)
zintd=double(zintd)
```

(output)

$$y = 5*\sin(5*x)^5$$

$$z = 25*\pi*\sin(5*x)^{10}$$

$$zintd = (1575*\pi^2)/256$$

$$zintd = 60.7212$$

>>

