

QUESTION 2

```
commandwindow
clear
clc
close
syms t
tn = (0.01:2.5)
d = 1.5*exp(-0.75*t)*sin(0.85*t)+(0.375*t)
dn = subs(d,tn)
figure(1)
plot(tn,dn)
xlabel('time (min)')
ylabel('distance (m)')
axis tight
grid on
grid minor

v=diff(d)
vn=subs(v,tn)
figure(2)
plot(tn,vn)
xlabel('time (min)')
ylabel('velocity (m/min)')
axis tight
grid on
grid minor

a=diff(v)
an=subs(a,tn)
figure(3)
plot(tn,an)
xlabel('time (min)')
ylabel('acceleration (m/min^2)')
axis tight
grid on
grid minor

figure(4)
plot(tn,dn,tn,vn,tn,an)
xlabel('time')
ylabel('variable')
legend('distance,velocity,acceleration')
```

OUTPUT

tn =

0.0100 1.0100 2.0100

d =

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

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]
```

Question 1

```
commandwindow
clear
clc
close
a = [0, 10, 4, 2
     -3, -17, 1, 2
     1, 1, 1, 0
     8, -34, 16, -10]
```

```
y = [-4
      2
      6
      4]
```

```
x = a^-1 * (y)
```

OUTPUT

a =

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

y =

-4

2

6

4

x =

9

-1

-2

7

QUESTION 3

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

OUTPUT

y =

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

z =

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

zintd =

$$(1575\pi^2)/256$$

zintd =

$$60.7212$$