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COURSE: ENG 281  
DEPARTMENT: MECHATRONICS  
MATRIC NUMBER: 16/ENG05/023

4A

```
commandwindow  
clear  
clc  
syms w x y z  
eqn1 = 10*x+4*y-2*z == -4;  
eqn2 = -3*w-17*x+y+2*z == 2;  
eqn3 = w+x+y == 6;  
eqn4 = 8*w-34*x+16*y-10*z == 4;  
[G,B] = equationsToMatrix([eqn1, eqn2, eqn3, eqn4], [w, x, y, z])  
ANS = linsolve(G,B)
```

OUTPUT

G =

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

B =

```
-4  
2  
6  
4
```

ANS =

```
4  
0  
2  
6
```

4B

```
commandwindow  
clear  
clc
```

```

clear all
syms t
d = 1.5^-0.75 * (sin(0.85*t)) + 0.375*t;
tn = [-2.5:0.01:2.5];
dv = diff(d)
dvn =subs(dv, tn);
figure (1)
plot(tn, dvn)
xlabel('time')
ylabel('velocity')
grid on
grid minor
da = diff(dv)
dan = subs(da, tn);
figure (2)
plot(tn, dan)
xlabel('time')
ylabel('acceleration')
grid on
grid minor

```

OUTPUT

dv =

$(56485925853373713 \cdot \cos((17 \cdot t)/20))/90071992547409920 + 3/8$

da =

$-(960260739507353121 \cdot \sin((17 \cdot t)/20))/1801439850948198400$

>>

4C

commandwindow

clear

clc

syms x

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

$yy=3.142 \cdot y^2$

$yint=int(yy,0,3.142)$

$yintd=double(yint)$

OUTPUT

y =

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

$$yy =$$

$$(1571*\sin(5*x)^{10})/20$$

$$yint =$$

$$(4713*\sin(1571/25))/5120 - (1571*\sin(1571/10))/512000 - (32991*\sin(1571/50))/10240 + (1571*\sin(3142/25))/40960 - (4713*\sin(4713/50))/20480 + 155486583/2560000$$

$$yintd =$$

$$60.7291$$