OCHENI VICTOR UGBEDEOJO 16/ENG04/037
ELECTRICAL/ELECTRONICS

QUESTION 4

a)

CODES;

```
1. commandwindow
2. clear
3. clc
4. A=[0 10 4 -2;-3 -17 1 2;1 1 1 0;8 -34 16 -10]
5. B=[-4;2;6;4]
6. invar= inv(A)
7. Answer=invar*B
8. sym Answer
9. w=Answer(1,1)
10.        x=Answer(2,1)
11.        y=Answer(3,1)
12.        z=Answer(4,1
```

COMMAND WINDOW (OUTPUT);

A =

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

B =

-4
2
6
4

invar =

-0.178571428571429 -0.102040816326531 0.571428571428571 0.0153061224489796
0.0357142857142857 -0.0153061224489796 0.0357142857142857 -0.0102040816326531
0.142857142857143 0.11734693877551 0.392857142857143 -0.00510204081632653
-0.0357142857142857 0.158163265306122 0.964285714285714 -0.0612244897959184

Answer =

4
-9.71445146547012e-17
2
6

ans =

Answer

w =

```
     4


x =

    -9.714451465470l2e-17


y =

                2


z =

                6

>>
```

b) CODES;

```
1. commandwindow
2. clear
3. clc
4. close all
5. syms t
6. d = 1.5*exp(-0.75*t)*sin(0.85*t)+0.375*t
7. tn = [0:0.01:2.5]
8. v=diff(d)
9. vn=subs (v,tn)
10.        figure(1)
11.        plot(tn,vn)
```

```
12.       xlabel('time(min)');
13.       ylabel('velocity(m/min)');
14.       grid on;
15.       grid minor;
16.       a=diff(v)
17.       an=subs (a,tn)
18.       figure(2)
19.       plot(tn,an)
20.       xlabel('time(min)');
21.       ylabel('acceleration(m/min^2)');
22.       grid on;
23.       grid minor;
24.       figure (3)
25.       plot(tn,vn,tn,an)
26.       axis tight
27.       xlabel('time(min)')
28.       ylabel('variable')
29.       grid on
30.       grid minor
31.       legend('velocity(m/min)','acceleration(m/min^2)','location','
   best')
```

COMMAND WINDOW(OUTPUT)

```
d =

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


tn =

  Columns 1 through 4
```

0 0.01 0.02 0.03

Columns 5 through 8

0.04 0.05 0.06 0.07

Columns 9 through 12

0.08 0.09 0.1 0.11

Columns 13 through 16

0.12 0.13 0.14 0.15

Columns 17 through 20

0.16 0.17 0.18 0.19

Columns 21 through 24

0.2 0.21 0.22 0.23

Columns 25 through 28

0.24 0.25 0.26 0.27

Columns 29 through 32

0.28 0.29 0.3 0.31

Columns 33 through 36

0.32 0.33 0.34 0.35

Columns 37 through 40

0.36 0.37 0.38 0.39

Columns 41 through 44

0.4 0.41 0.42 0.43

Columns 45 through 48

0.44 0.45 0.46 0.47

Columns 49 through 52

0.48 0.49 0.5 0.51

Columns 53 through 56

0.52 0.53 0.54 0.55

Columns 57 through 60

0.56 0.57 0.58 0.59

Columns 61 through 64

0.6 0.61 0.62 0.63

Columns 65 through 68

0.64 0.65 0.66 0.67

Columns 69 through 72

0.68 0.69 0.7 0.71

Columns 73 through 76

0.72 0.73 0.74 0.75

Columns 77 through 80

0.76 0.77 0.78 0.79

Columns 81 through 84

0.8 0.81 0.82 0.83

Columns 85 through 88

0.84 0.85 0.86 0.87

Columns 89 through 92

0.88 0.89 0.9 0.91

Columns 93 through 96

0.92 0.93 0.94 0.95

Columns 97 through 100

0.96 0.97 0.98 0.99

Columns 101 through 104

1 1.01 1.02 1.03

Columns 105 through 108

1.04 1.05 1.06 1.07

Columns 109 through 112

1.08 1.09 1.1 1.11

Columns 113 through 116

1.12 1.13 1.14 1.15

Columns 117 through 120

1.16 1.17 1.18 1.19

Columns 121 through 124

1.2 1.21 1.22 1.23

Columns 125 through 128

1.24 1.25 1.26 1.27

Columns 129 through 132

1.28 1.29 1.3 1.31

Columns 133 through 136

1.32 1.33 1.34 1.35

Columns 137 through 140

1.36 1.37 1.38 1.39

Columns 141 through 144

1.4 1.41 1.42 1.43

Columns 145 through 148

1.44 1.45 1.46 1.47

Columns 149 through 152

1.48 1.49 1.5 1.51

Columns 153 through 156

1.52 1.53 1.54 1.55

Columns 157 through 160

1.56 1.57 1.58 1.59

Columns 161 through 164

1.6 1.61 1.62 1.63

Columns 165 through 168

1.64 1.65 1.66 1.67

Columns 169 through 172

1.68 1.69 1.7 1.71

Columns 173 through 176

1.72 1.73 1.74 1.75

Columns 177 through 180

1.76 1.77 1.78 1.79

Columns 181 through 184

1.8 1.81 1.82 1.83

Columns 185 through 188

1.84 1.85 1.86 1.87

Columns 189 through 192

1.88 1.89 1.9 1.91

Columns 193 through 196

1.92 1.93 1.94 1.95

Columns 197 through 200

1.96 1.97 1.98 1.99

Columns 201 through 204

2 2.01 2.02 2.03

Columns 205 through 208

2.04 2.05 2.06 2.07

Columns 209 through 212

2.08 2.09 2.1 2.11

Columns 213 through 216

2.12 2.13 2.14 2.15

Columns 217 through 220

2.16 2.17 2.18 2.19

Columns 221 through 224

2.2 2.21 2.22 2.23

Columns 225 through 228

2.24 2.25 2.26 2.27

Columns 229 through 232

2.28 2.29 2.3 2.31

Columns 233 through 236

2.32 2.33 2.34 2.35

Columns 237 through 240

2.36 2.37 2.38 2.39

Columns 241 through 244

2.4 2.41 2.42 2.43

Columns 245 through 248

2.44 2.45 2.46 2.47

Columns 249 through 251

2.48 2.49 2.5

v =

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

vn =

[33/20, (51*cos(17/2000)*exp(-3/400))/40 - (9*exp(-3/400)*sin(17/2000))/8 + 3/8, (51*cos(17/1000)*exp(-3/200))/40 - (9*exp(-3/200)*sin(17/1000))/8 + 3/8, (51*cos(51/2000)*exp(-9/400))/40 - (9*exp(-9/400)*sin(51/2000))/8 + 3/8,

(51*cos(17/500)*exp(-3/100))/40 - (9*exp(-3/100)*sin(17/500))/8 + 3/8, (51*cos(17/400)*exp(-3/80))/40 - (9*exp(-3/80)*sin(17/400))/8 + 3/8, (51*cos(51/1000)*exp(-9/200))/40 - (9*exp(-9/200)*sin(51/1000))/8 + 3/8, (51*cos(119/2000)*exp(-21/400))/40 - (9*exp(-21/400)*sin(119/2000))/8 + 3/8, (51*cos(17/250)*exp(-3/50))/40 - (9*exp(-3/50)*sin(17/250))/8 + 3/8, (51*cos(153/2000)*exp(-27/400))/40 - (9*exp(-27/400)*sin(153/2000))/8 + 3/8, (51*cos(17/200)*exp(-3/40))/40 - (9*exp(-3/40)*sin(17/200))/8 + 3/8, (51*cos(187/2000)*exp(-33/400))/40 - (9*exp(-33/400)*sin(187/2000))/8 + 3/8, (51*cos(51/500)*exp(-9/100))/40 - (9*exp(-9/100)*sin(51/500))/8 + 3/8, (51*cos(221/2000)*exp(-39/400))/40 - (9*exp(-39/400)*sin(221/2000))/8 + 3/8, (51*cos(119/1000)*exp(-21/200))/40 - (9*exp(-21/200)*sin(119/1000))/8 + 3/8, (51*cos(51/400)*exp(-9/80))/40 - (9*exp(-9/80)*sin(51/400))/8 + 3/8, (51*cos(17/125)*exp(-3/25))/40 - (9*exp(-3/25)*sin(17/125))/8 + 3/8, (51*cos(289/2000)*exp(-51/400))/40 - (9*exp(-51/400)*sin(289/2000))/8 + 3/8, (51*cos(153/1000)*exp(-27/200))/40 - (9*exp(-27/200)*sin(153/1000))/8 + 3/8, (51*cos(323/2000)*exp(-57/400))/40 - (9*exp(-57/400)*sin(323/2000))/8 + 3/8, (51*cos(17/100)*exp(-3/20))/40 - (9*exp(-3/20)*sin(17/100))/8 + 3/8, (51*cos(357/2000)*exp(-63/400))/40 - (9*exp(-63/400)*sin(357/2000))/8 + 3/8, (51*cos(187/1000)*exp(-33/200))/40 - (9*exp(-33/200)*sin(187/1000))/8 + 3/8, (51*cos(391/2000)*exp(-69/400))/40 - (9*exp(-69/400)*sin(391/2000))/8 + 3/8, (51*cos(51/250)*exp(-9/50))/40 - (9*exp(-9/50)*sin(51/250))/8 + 3/8, (51*cos(17/80)*exp(-3/16))/40 - (9*exp(-3/16)*sin(17/80))/8 + 3/8, (51*cos(221/1000)*exp(-39/200))/40 - (9*exp(-39/200)*sin(221/1000))/8 + 3/8, (51*cos(459/2000)*exp(-81/400))/40 - (9*exp(-81/400)*sin(459/2000))/8 + 3/8, (51*cos(119/500)*exp(-21/100))/40 - (9*exp(-21/100)*sin(119/500))/8 + 3/8, (51*cos(493/2000)*exp(-

87/400))/40 - (9*exp(-87/400)*sin(493/2000))/8 + 3/8, (51*cos(51/200)*exp(-9/40))/40 - (9*exp(-9/40)*sin(51/200))/8 + 3/8, (51*cos(527/2000)*exp(-93/400))/40 - (9*exp(-93/400)*sin(527/2000))/8 + 3/8, (51*cos(34/125)*exp(-6/25))/40 - (9*exp(-6/25)*sin(34/125))/8 + 3/8, (51*cos(561/2000)*exp(-99/400))/40 - (9*exp(-99/400)*sin(561/2000))/8 + 3/8, (51*cos(289/1000)*exp(-51/200))/40 - (9*exp(-51/200)*sin(289/1000))/8 + 3/8, (51*cos(119/400)*exp(-21/80))/40 - (9*exp(-21/80)*sin(119/400))/8 + 3/8, (51*cos(153/500)*exp(-27/100))/40 - (9*exp(-27/100)*sin(153/500))/8 + 3/8, (51*cos(629/2000)*exp(-111/400))/40 - (9*exp(-111/400)*sin(629/2000))/8 + 3/8, (51*cos(323/1000)*exp(-57/200))/40 - (9*exp(-57/200)*sin(323/1000))/8 + 3/8, (51*cos(663/2000)*exp(-117/400))/40 - (9*exp(-117/400)*sin(663/2000))/8 + 3/8, (51*cos(17/50)*exp(-3/10))/40 - (9*exp(-3/10)*sin(17/50))/8 + 3/8, (51*cos(697/2000)*exp(-123/400))/40 - (9*exp(-123/400)*sin(697/2000))/8 + 3/8, (51*cos(357/1000)*exp(-63/200))/40 - (9*exp(-63/200)*sin(357/1000))/8 + 3/8, (51*cos(731/2000)*exp(-129/400))/40 - (9*exp(-129/400)*sin(731/2000))/8 + 3/8, (51*cos(187/500)*exp(-33/100))/40 - (9*exp(-33/100)*sin(187/500))/8 + 3/8, (51*cos(153/400)*exp(-27/80))/40 - (9*exp(-27/80)*sin(153/400))/8 + 3/8, (51*cos(391/1000)*exp(-69/200))/40 - (9*exp(-69/200)*sin(391/1000))/8 + 3/8, (51*cos(799/2000)*exp(-141/400))/40 - (9*exp(-141/400)*sin(799/2000))/8 + 3/8, (51*cos(51/125)*exp(-9/25))/40 - (9*exp(-9/25)*sin(51/125))/8 + 3/8, (51*cos(833/2000)*exp(-147/400))/40 - (9*exp(-147/400)*sin(833/2000))/8 + 3/8, (51*cos(17/40)*exp(-3/8))/40 - (9*exp(-3/8)*sin(17/40))/8 + 3/8, (51*cos(867/2000)*exp(-153/400))/40 - (9*exp(-153/400)*sin(867/2000))/8 + 3/8, (51*cos(221/500)*exp(-39/100))/40 - (9*exp(-39/100)*sin(221/500))/8 + 3/8, (51*cos(901/2000)*exp(-159/400))/40 - (9*exp(-

159/400)*sin(901/2000))/8 + 3/8, (51*cos(459/1000)*exp(-81/200))/40 - (9*exp(-81/200)*sin(459/1000))/8 + 3/8, (51*cos(187/400)*exp(-33/80))/40 - (9*exp(-33/80)*sin(187/400))/8 + 3/8, (51*cos(119/250)*exp(-21/50))/40 - (9*exp(-21/50)*sin(119/250))/8 + 3/8, (51*cos(969/2000)*exp(-171/400))/40 - (9*exp(-171/400)*sin(969/2000))/8 + 3/8, (51*cos(493/1000)*exp(-87/200))/40 - (9*exp(-87/200)*sin(493/1000))/8 + 3/8, (51*cos(1003/2000)*exp(-177/400))/40 - (9*exp(-177/400)*sin(1003/2000))/8 + 3/8, (51*cos(51/100)*exp(-9/20))/40 - (9*exp(-9/20)*sin(51/100))/8 + 3/8, (51*cos(1037/2000)*exp(-183/400))/40 - (9*exp(-183/400)*sin(1037/2000))/8 + 3/8, (51*cos(527/1000)*exp(-93/200))/40 - (9*exp(-93/200)*sin(527/1000))/8 + 3/8, (51*cos(1071/2000)*exp(-189/400))/40 - (9*exp(-189/400)*sin(1071/2000))/8 + 3/8, (51*cos(68/125)*exp(-12/25))/40 - (9*exp(-12/25)*sin(68/125))/8 + 3/8, (51*cos(221/400)*exp(-39/80))/40 - (9*exp(-39/80)*sin(221/400))/8 + 3/8, (51*cos(561/1000)*exp(-99/200))/40 - (9*exp(-99/200)*sin(561/1000))/8 + 3/8, (51*cos(1139/2000)*exp(-201/400))/40 - (9*exp(-201/400)*sin(1139/2000))/8 + 3/8, (51*cos(289/500)*exp(-51/100))/40 - (9*exp(-51/100)*sin(289/500))/8 + 3/8, (51*cos(1173/2000)*exp(-207/400))/40 - (9*exp(-207/400)*sin(1173/2000))/8 + 3/8, (51*cos(119/200)*exp(-21/40))/40 - (9*exp(-21/40)*sin(119/200))/8 + 3/8, (51*cos(1207/2000)*exp(-213/400))/40 - (9*exp(-213/400)*sin(1207/2000))/8 + 3/8, (51*cos(153/250)*exp(-27/50))/40 - (9*exp(-27/50)*sin(153/250))/8 + 3/8, (51*cos(1241/2000)*exp(-219/400))/40 - (9*exp(-219/400)*sin(1241/2000))/8 + 3/8, (51*cos(629/1000)*exp(-111/200))/40 - (9*exp(-111/200)*sin(629/1000))/8 + 3/8, (51*cos(51/80)*exp(-9/16))/40 - (9*exp(-9/16)*sin(51/80))/8 + 3/8, (51*cos(323/500)*exp(-57/100))/40 - (9*exp(-57/100)*sin(323/500))/8 + 3/8, (51*cos(1309/2000)*exp(-

231/400))/40 - (9*exp(-231/400)*sin(1309/2000))/8 + 3/8, (51*cos(663/1000)*exp(-117/200))/40 - (9*exp(-117/200)*sin(663/1000))/8 + 3/8, (51*cos(1343/2000)*exp(-237/400))/40 - (9*exp(-237/400)*sin(1343/2000))/8 + 3/8, (51*cos(17/25)*exp(-3/5))/40 - (9*exp(-3/5)*sin(17/25))/8 + 3/8, (51*cos(1377/2000)*exp(-243/400))/40 - (9*exp(-243/400)*sin(1377/2000))/8 + 3/8, (51*cos(697/1000)*exp(-123/200))/40 - (9*exp(-123/200)*sin(697/1000))/8 + 3/8, (51*cos(1411/2000)*exp(-249/400))/40 - (9*exp(-249/400)*sin(1411/2000))/8 + 3/8, (51*cos(357/500)*exp(-63/100))/40 - (9*exp(-63/100)*sin(357/500))/8 + 3/8, (51*cos(289/400)*exp(-51/80))/40 - (9*exp(-51/80)*sin(289/400))/8 + 3/8, (51*cos(731/1000)*exp(-129/200))/40 - (9*exp(-129/200)*sin(731/1000))/8 + 3/8, (51*cos(1479/2000)*exp(-261/400))/40 - (9*exp(-261/400)*sin(1479/2000))/8 + 3/8, (51*cos(187/250)*exp(-33/50))/40 - (9*exp(-33/50)*sin(187/250))/8 + 3/8, (51*cos(1513/2000)*exp(-267/400))/40 - (9*exp(-267/400)*sin(1513/2000))/8 + 3/8, (51*cos(153/200)*exp(-27/40))/40 - (9*exp(-27/40)*sin(153/200))/8 + 3/8, (51*cos(1547/2000)*exp(-273/400))/40 - (9*exp(-273/400)*sin(1547/2000))/8 + 3/8, (51*cos(391/500)*exp(-69/100))/40 - (9*exp(-69/100)*sin(391/500))/8 + 3/8, (51*cos(1581/2000)*exp(-279/400))/40 - (9*exp(-279/400)*sin(1581/2000))/8 + 3/8, (51*cos(799/1000)*exp(-141/200))/40 - (9*exp(-141/200)*sin(799/1000))/8 + 3/8, (51*cos(323/400)*exp(-57/80))/40 - (9*exp(-57/80)*sin(323/400))/8 + 3/8, (51*cos(102/125)*exp(-18/25))/40 - (9*exp(-18/25)*sin(102/125))/8 + 3/8, (51*cos(1649/2000)*exp(-291/400))/40 - (9*exp(-291/400)*sin(1649/2000))/8 + 3/8, (51*cos(833/1000)*exp(-147/200))/40 - (9*exp(-147/200)*sin(833/1000))/8 + 3/8, (51*cos(1683/2000)*exp(-297/400))/40 - (9*exp(-297/400)*sin(1683/2000))/8 + 3/8, (51*cos(17/20)*exp(-3/4))/40 - (9*exp(-3/4)*sin(17/20))/8 + 3/8,

(51*cos(1717/2000)*exp(-303/400))/40 - (9*exp(-303/400)*sin(1717/2000))/8 + 3/8, (51*cos(867/1000)*exp(-153/200))/40 - (9*exp(-153/200)*sin(867/1000))/8 + 3/8, (51*cos(1751/2000)*exp(-309/400))/40 - (9*exp(-309/400)*sin(1751/2000))/8 + 3/8, (51*cos(221/250)*exp(-39/50))/40 - (9*exp(-39/50)*sin(221/250))/8 + 3/8, (51*cos(357/400)*exp(-63/80))/40 - (9*exp(-63/80)*sin(357/400))/8 + 3/8, (51*cos(901/1000)*exp(-159/200))/40 - (9*exp(-159/200)*sin(901/1000))/8 + 3/8, (51*cos(1819/2000)*exp(-321/400))/40 - (9*exp(-321/400)*sin(1819/2000))/8 + 3/8, (51*cos(459/500)*exp(-81/100))/40 - (9*exp(-81/100)*sin(459/500))/8 + 3/8, (51*cos(1853/2000)*exp(-327/400))/40 - (9*exp(-327/400)*sin(1853/2000))/8 + 3/8, (51*cos(187/200)*exp(-33/40))/40 - (9*exp(-33/40)*sin(187/200))/8 + 3/8, (51*cos(1887/2000)*exp(-333/400))/40 - (9*exp(-333/400)*sin(1887/2000))/8 + 3/8, (51*cos(119/125)*exp(-21/25))/40 - (9*exp(-21/25)*sin(119/125))/8 + 3/8, (51*cos(1921/2000)*exp(-339/400))/40 - (9*exp(-339/400)*sin(1921/2000))/8 + 3/8, (51*cos(969/1000)*exp(-171/200))/40 - (9*exp(-171/200)*sin(969/1000))/8 + 3/8, (51*cos(391/400)*exp(-69/80))/40 - (9*exp(-69/80)*sin(391/400))/8 + 3/8, (51*cos(493/500)*exp(-87/100))/40 - (9*exp(-87/100)*sin(493/500))/8 + 3/8, (51*cos(1989/2000)*exp(-351/400))/40 - (9*exp(-351/400)*sin(1989/2000))/8 + 3/8, (51*cos(1003/1000)*exp(-177/200))/40 - (9*exp(-177/200)*sin(1003/1000))/8 + 3/8, (51*cos(2023/2000)*exp(-357/400))/40 - (9*exp(-357/400)*sin(2023/2000))/8 + 3/8, (51*cos(51/50)*exp(-9/10))/40 - (9*exp(-9/10)*sin(51/50))/8 + 3/8, (51*cos(2057/2000)*exp(-363/400))/40 - (9*exp(-363/400)*sin(2057/2000))/8 + 3/8, (51*cos(1037/1000)*exp(-183/200))/40 - (9*exp(-183/200)*sin(1037/1000))/8 + 3/8, (51*cos(2091/2000)*exp(-369/400))/40 - (9*exp(-369/400)*sin(2091/2000))/8 + 3/8, (51*cos(527/500)*exp(-

93/100))/40 - (9*exp(-93/100)*sin(527/500))/8 + 3/8, (51*cos(17/16)*exp(-15/16))/40 - (9*exp(-15/16)*sin(17/16))/8 + 3/8, (51*cos(1071/1000)*exp(-189/200))/40 - (9*exp(-189/200)*sin(1071/1000))/8 + 3/8, (51*cos(2159/2000)*exp(-381/400))/40 - (9*exp(-381/400)*sin(2159/2000))/8 + 3/8, (51*cos(136/125)*exp(-24/25))/40 - (9*exp(-24/25)*sin(136/125))/8 + 3/8, (51*cos(2193/2000)*exp(-387/400))/40 - (9*exp(-387/400)*sin(2193/2000))/8 + 3/8, (51*cos(221/200)*exp(-39/40))/40 - (9*exp(-39/40)*sin(221/200))/8 + 3/8, (51*cos(2227/2000)*exp(-393/400))/40 - (9*exp(-393/400)*sin(2227/2000))/8 + 3/8, (51*cos(561/500)*exp(-99/100))/40 - (9*exp(-99/100)*sin(561/500))/8 + 3/8, (51*cos(2261/2000)*exp(-399/400))/40 - (9*exp(-399/400)*sin(2261/2000))/8 + 3/8, (51*cos(1139/1000)*exp(-201/200))/40 - (9*exp(-201/200)*sin(1139/1000))/8 + 3/8, (51*cos(459/400)*exp(-81/80))/40 - (9*exp(-81/80)*sin(459/400))/8 + 3/8, (51*cos(289/250)*exp(-51/50))/40 - (9*exp(-51/50)*sin(289/250))/8 + 3/8, (51*cos(2329/2000)*exp(-411/400))/40 - (9*exp(-411/400)*sin(2329/2000))/8 + 3/8, (51*cos(1173/1000)*exp(-207/200))/40 - (9*exp(-207/200)*sin(1173/1000))/8 + 3/8, (51*cos(2363/2000)*exp(-417/400))/40 - (9*exp(-417/400)*sin(2363/2000))/8 + 3/8, (51*cos(119/100)*exp(-21/20))/40 - (9*exp(-21/20)*sin(119/100))/8 + 3/8, (51*cos(2397/2000)*exp(-423/400))/40 - (9*exp(-423/400)*sin(2397/2000))/8 + 3/8, (51*cos(1207/1000)*exp(-213/200))/40 - (9*exp(-213/200)*sin(1207/1000))/8 + 3/8, (51*cos(2431/2000)*exp(-429/400))/40 - (9*exp(-429/400)*sin(2431/2000))/8 + 3/8, (51*cos(153/125)*exp(-27/25))/40 - (9*exp(-27/25)*sin(153/125))/8 + 3/8, (51*cos(493/400)*exp(-87/80))/40 - (9*exp(-87/80)*sin(493/400))/8 + 3/8, (51*cos(1241/1000)*exp(-219/200))/40 - (9*exp(-219/200)*sin(1241/1000))/8 + 3/8, (51*cos(2499/2000)*exp(-441/400))/40 - (9*exp(-441/400)*sin(2499/2000))/8 + 3/8,

(51*cos(629/500)*exp(-111/100))/40 - (9*exp(-111/100)*sin(629/500))/8 + 3/8, (51*cos(2533/2000)*exp(-447/400))/40 - (9*exp(-447/400)*sin(2533/2000))/8 + 3/8, (51*cos(51/40)*exp(-9/8))/40 - (9*exp(-9/8)*sin(51/40))/8 + 3/8, (51*cos(2567/2000)*exp(-453/400))/40 - (9*exp(-453/400)*sin(2567/2000))/8 + 3/8, (51*cos(323/250)*exp(-57/50))/40 - (9*exp(-57/50)*sin(323/250))/8 + 3/8, (51*cos(2601/2000)*exp(-459/400))/40 - (9*exp(-459/400)*sin(2601/2000))/8 + 3/8, (51*cos(1309/1000)*exp(-231/200))/40 - (9*exp(-231/200)*sin(1309/1000))/8 + 3/8, (51*cos(527/400)*exp(-93/80))/40 - (9*exp(-93/80)*sin(527/400))/8 + 3/8, (51*cos(663/500)*exp(-117/100))/40 - (9*exp(-117/100)*sin(663/500))/8 + 3/8, (51*cos(2669/2000)*exp(-471/400))/40 - (9*exp(-471/400)*sin(2669/2000))/8 + 3/8, (51*cos(1343/1000)*exp(-237/200))/40 - (9*exp(-237/200)*sin(1343/1000))/8 + 3/8, (51*cos(2703/2000)*exp(-477/400))/40 - (9*exp(-477/400)*sin(2703/2000))/8 + 3/8, (51*cos(34/25)*exp(-6/5))/40 - (9*exp(-6/5)*sin(34/25))/8 + 3/8, (51*cos(2737/2000)*exp(-483/400))/40 - (9*exp(-483/400)*sin(2737/2000))/8 + 3/8, (51*cos(1377/1000)*exp(-243/200))/40 - (9*exp(-243/200)*sin(1377/1000))/8 + 3/8, (51*cos(2771/2000)*exp(-489/400))/40 - (9*exp(-489/400)*sin(2771/2000))/8 + 3/8, (51*cos(697/500)*exp(-123/100))/40 - (9*exp(-123/100)*sin(697/500))/8 + 3/8, (51*cos(561/400)*exp(-99/80))/40 - (9*exp(-99/80)*sin(561/400))/8 + 3/8, (51*cos(1411/1000)*exp(-249/200))/40 - (9*exp(-249/200)*sin(1411/1000))/8 + 3/8, (51*cos(2839/2000)*exp(-501/400))/40 - (9*exp(-501/400)*sin(2839/2000))/8 + 3/8, (51*cos(357/250)*exp(-63/50))/40 - (9*exp(-63/50)*sin(357/250))/8 + 3/8, (51*cos(2873/2000)*exp(-507/400))/40 - (9*exp(-507/400)*sin(2873/2000))/8 + 3/8, (51*cos(289/200)*exp(-51/40))/40 - (9*exp(-51/40)*sin(289/200))/8 + 3/8, (51*cos(2907/2000)*exp(-513/400))/40 - (9*exp(-

513/400)*sin(2907/2000))/8 + 3/8, (51*cos(731/500)*exp(-129/100))/40 - (9*exp(-129/100)*sin(731/500))/8 + 3/8, (51*cos(2941/2000)*exp(-519/400))/40 - (9*exp(-519/400)*sin(2941/2000))/8 + 3/8, (51*cos(1479/1000)*exp(-261/200))/40 - (9*exp(-261/200)*sin(1479/1000))/8 + 3/8, (51*cos(119/80)*exp(-21/16))/40 - (9*exp(-21/16)*sin(119/80))/8 + 3/8, (51*cos(187/125)*exp(-33/25))/40 - (9*exp(-33/25)*sin(187/125))/8 + 3/8, (51*cos(3009/2000)*exp(-531/400))/40 - (9*exp(-531/400)*sin(3009/2000))/8 + 3/8, (51*cos(1513/1000)*exp(-267/200))/40 - (9*exp(-267/200)*sin(1513/1000))/8 + 3/8, (51*cos(3043/2000)*exp(-537/400))/40 - (9*exp(-537/400)*sin(3043/2000))/8 + 3/8, (51*cos(153/100)*exp(-27/20))/40 - (9*exp(-27/20)*sin(153/100))/8 + 3/8, (51*cos(3077/2000)*exp(-543/400))/40 - (9*exp(-543/400)*sin(3077/2000))/8 + 3/8, (51*cos(1547/1000)*exp(-273/200))/40 - (9*exp(-273/200)*sin(1547/1000))/8 + 3/8, (51*cos(3111/2000)*exp(-549/400))/40 - (9*exp(-549/400)*sin(3111/2000))/8 + 3/8, (51*cos(391/250)*exp(-69/50))/40 - (9*exp(-69/50)*sin(391/250))/8 + 3/8, (51*cos(629/400)*exp(-111/80))/40 - (9*exp(-111/80)*sin(629/400))/8 + 3/8, (51*cos(1581/1000)*exp(-279/200))/40 - (9*exp(-279/200)*sin(1581/1000))/8 + 3/8, (51*cos(3179/2000)*exp(-561/400))/40 - (9*exp(-561/400)*sin(3179/2000))/8 + 3/8, (51*cos(799/500)*exp(-141/100))/40 - (9*exp(-141/100)*sin(799/500))/8 + 3/8, (51*cos(3213/2000)*exp(-567/400))/40 - (9*exp(-567/400)*sin(3213/2000))/8 + 3/8, (51*cos(323/200)*exp(-57/40))/40 - (9*exp(-57/40)*sin(323/200))/8 + 3/8, (51*cos(3247/2000)*exp(-573/400))/40 - (9*exp(-573/400)*sin(3247/2000))/8 + 3/8, (51*cos(204/125)*exp(-36/25))/40 - (9*exp(-36/25)*sin(204/125))/8 + 3/8, (51*cos(3281/2000)*exp(-579/400))/40 - (9*exp(-579/400)*sin(3281/2000))/8 + 3/8, (51*cos(1649/1000)*exp(-

291/200))/40 - (9*exp(-291/200)*sin(1649/1000))/8 + 3/8, (51*cos(663/400)*exp(-117/80))/40 - (9*exp(-117/80)*sin(663/400))/8 + 3/8, (51*cos(833/500)*exp(-147/100))/40 - (9*exp(-147/100)*sin(833/500))/8 + 3/8, (51*cos(3349/2000)*exp(-591/400))/40 - (9*exp(-591/400)*sin(3349/2000))/8 + 3/8, (51*cos(1683/1000)*exp(-297/200))/40 - (9*exp(-297/200)*sin(1683/1000))/8 + 3/8, (51*cos(3383/2000)*exp(-597/400))/40 - (9*exp(-597/400)*sin(3383/2000))/8 + 3/8, (51*cos(17/10)*exp(-3/2))/40 - (9*exp(-3/2)*sin(17/10))/8 + 3/8, (51*cos(3417/2000)*exp(-603/400))/40 - (9*exp(-603/400)*sin(3417/2000))/8 + 3/8, (51*cos(1717/1000)*exp(-303/200))/40 - (9*exp(-303/200)*sin(1717/1000))/8 + 3/8, (51*cos(3451/2000)*exp(-609/400))/40 - (9*exp(-609/400)*sin(3451/2000))/8 + 3/8, (51*cos(867/500)*exp(-153/100))/40 - (9*exp(-153/100)*sin(867/500))/8 + 3/8, (51*cos(697/400)*exp(-123/80))/40 - (9*exp(-123/80)*sin(697/400))/8 + 3/8, (51*cos(1751/1000)*exp(-309/200))/40 - (9*exp(-309/200)*sin(1751/1000))/8 + 3/8, (51*cos(3519/2000)*exp(-621/400))/40 - (9*exp(-621/400)*sin(3519/2000))/8 + 3/8, (51*cos(221/125)*exp(-39/25))/40 - (9*exp(-39/25)*sin(221/125))/8 + 3/8, (51*cos(3553/2000)*exp(-627/400))/40 - (9*exp(-627/400)*sin(3553/2000))/8 + 3/8, (51*cos(357/200)*exp(-63/40))/40 - (9*exp(-63/40)*sin(357/200))/8 + 3/8, (51*cos(3587/2000)*exp(-633/400))/40 - (9*exp(-633/400)*sin(3587/2000))/8 + 3/8, (51*cos(901/500)*exp(-159/100))/40 - (9*exp(-159/100)*sin(901/500))/8 + 3/8, (51*cos(3621/2000)*exp(-639/400))/40 - (9*exp(-639/400)*sin(3621/2000))/8 + 3/8, (51*cos(1819/1000)*exp(-321/200))/40 - (9*exp(-321/200)*sin(1819/1000))/8 + 3/8, (51*cos(731/400)*exp(-129/80))/40 - (9*exp(-129/80)*sin(731/400))/8 + 3/8, (51*cos(459/250)*exp(-81/50))/40 - (9*exp(-81/50)*sin(459/250))/8 + 3/8, (51*cos(3689/2000)*exp(-

651/400))/40 - (9*exp(-651/400)*sin(3689/2000))/8 + 3/8, (51*cos(1853/1000)*exp(-327/200))/40 - (9*exp(-327/200)*sin(1853/1000))/8 + 3/8, (51*cos(3723/2000)*exp(-657/400))/40 - (9*exp(-657/400)*sin(3723/2000))/8 + 3/8, (51*cos(187/100)*exp(-33/20))/40 - (9*exp(-33/20)*sin(187/100))/8 + 3/8, (51*cos(3757/2000)*exp(-663/400))/40 - (9*exp(-663/400)*sin(3757/2000))/8 + 3/8, (51*cos(1887/1000)*exp(-333/200))/40 - (9*exp(-333/200)*sin(1887/1000))/8 + 3/8, (51*cos(3791/2000)*exp(-669/400))/40 - (9*exp(-669/400)*sin(3791/2000))/8 + 3/8, (51*cos(238/125)*exp(-42/25))/40 - (9*exp(-42/25)*sin(238/125))/8 + 3/8, (51*cos(153/80)*exp(-27/16))/40 - (9*exp(-27/16)*sin(153/80))/8 + 3/8, (51*cos(1921/1000)*exp(-339/200))/40 - (9*exp(-339/200)*sin(1921/1000))/8 + 3/8, (51*cos(3859/2000)*exp(-681/400))/40 - (9*exp(-681/400)*sin(3859/2000))/8 + 3/8, (51*cos(969/500)*exp(-171/100))/40 - (9*exp(-171/100)*sin(969/500))/8 + 3/8, (51*cos(3893/2000)*exp(-687/400))/40 - (9*exp(-687/400)*sin(3893/2000))/8 + 3/8, (51*cos(391/200)*exp(-69/40))/40 - (9*exp(-69/40)*sin(391/200))/8 + 3/8, (51*cos(3927/2000)*exp(-693/400))/40 - (9*exp(-693/400)*sin(3927/2000))/8 + 3/8, (51*cos(493/250)*exp(-87/50))/40 - (9*exp(-87/50)*sin(493/250))/8 + 3/8, (51*cos(3961/2000)*exp(-699/400))/40 - (9*exp(-699/400)*sin(3961/2000))/8 + 3/8, (51*cos(1989/1000)*exp(-351/200))/40 - (9*exp(-351/200)*sin(1989/1000))/8 + 3/8, (51*cos(799/400)*exp(-141/80))/40 - (9*exp(-141/80)*sin(799/400))/8 + 3/8, (51*cos(1003/500)*exp(-177/100))/40 - (9*exp(-177/100)*sin(1003/500))/8 + 3/8, (51*cos(4029/2000)*exp(-711/400))/40 - (9*exp(-711/400)*sin(4029/2000))/8 + 3/8, (51*cos(2023/1000)*exp(-357/200))/40 - (9*exp(-357/200)*sin(2023/1000))/8 + 3/8, (51*cos(4063/2000)*exp(-717/400))/40 - (9*exp(-717/400)*sin(4063/2000))/8 + 3/8, (51*cos(51/25)*exp(-9/5))/40 -

(9*exp(-9/5)*sin(51/25))/8 + 3/8, (51*cos(4097/2000)*exp(-723/400))/40 - (9*exp(-723/400)*sin(4097/2000))/8 + 3/8, (51*cos(2057/1000)*exp(-363/200))/40 - (9*exp(-363/200)*sin(2057/1000))/8 + 3/8, (51*cos(4131/2000)*exp(-729/400))/40 - (9*exp(-729/400)*sin(4131/2000))/8 + 3/8, (51*cos(1037/500)*exp(-183/100))/40 - (9*exp(-183/100)*sin(1037/500))/8 + 3/8, (51*cos(833/400)*exp(-147/80))/40 - (9*exp(-147/80)*sin(833/400))/8 + 3/8, (51*cos(2091/1000)*exp(-369/200))/40 - (9*exp(-369/200)*sin(2091/1000))/8 + 3/8, (51*cos(4199/2000)*exp(-741/400))/40 - (9*exp(-741/400)*sin(4199/2000))/8 + 3/8, (51*cos(527/250)*exp(-93/50))/40 - (9*exp(-93/50)*sin(527/250))/8 + 3/8, (51*cos(4233/2000)*exp(-747/400))/40 - (9*exp(-747/400)*sin(4233/2000))/8 + 3/8, (51*cos(17/8)*exp(-15/8))/40 - (9*exp(-15/8)*sin(17/8))/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 =

[-153/80, - (153*cos(17/2000)*exp(-3/400))/80 - (6*exp(-3/400)*sin(17/2000))/25, - (153*cos(17/1000)*exp(-3/200))/80 - (6*exp(-3/200)*sin(17/1000))/25, - (153*cos(51/2000)*exp(-9/400))/80 - (6*exp(-9/400)*sin(51/2000))/25, - (153*cos(17/500)*exp(-3/100))/80 - (6*exp(-3/100)*sin(17/500))/25, - (153*cos(17/400)*exp(-3/80))/80 - (6*exp(-3/80)*sin(17/400))/25, - (153*cos(51/1000)*exp(-9/200))/80 - (6*exp(-9/200)*sin(51/1000))/25, -

(153*cos(119/2000)*exp(-21/400))/80 - (6*exp(-21/400)*sin(119/2000))/25, - (153*cos(17/250)*exp(-3/50))/80 - (6*exp(-3/50)*sin(17/250))/25, - (153*cos(153/2000)*exp(-27/400))/80 - (6*exp(-27/400)*sin(153/2000))/25, - (153*cos(17/200)*exp(-3/40))/80 - (6*exp(-3/40)*sin(17/200))/25, - (153*cos(187/2000)*exp(-33/400))/80 - (6*exp(-33/400)*sin(187/2000))/25, - (153*cos(51/500)*exp(-9/100))/80 - (6*exp(-9/100)*sin(51/500))/25, - (153*cos(221/2000)*exp(-39/400))/80 - (6*exp(-39/400)*sin(221/2000))/25, - (153*cos(119/1000)*exp(-21/200))/80 - (6*exp(-21/200)*sin(119/1000))/25, - (153*cos(51/400)*exp(-9/80))/80 - (6*exp(-9/80)*sin(51/400))/25, - (153*cos(17/125)*exp(-3/25))/80 - (6*exp(-3/25)*sin(17/125))/25, - (153*cos(289/2000)*exp(-51/400))/80 - (6*exp(-51/400)*sin(289/2000))/25, - (153*cos(153/1000)*exp(-27/200))/80 - (6*exp(-27/200)*sin(153/1000))/25, - (153*cos(323/2000)*exp(-57/400))/80 - (6*exp(-57/400)*sin(323/2000))/25, - (153*cos(17/100)*exp(-3/20))/80 - (6*exp(-3/20)*sin(17/100))/25, - (153*cos(357/2000)*exp(-63/400))/80 - (6*exp(-63/400)*sin(357/2000))/25, - (153*cos(187/1000)*exp(-33/200))/80 - (6*exp(-33/200)*sin(187/1000))/25, - (153*cos(391/2000)*exp(-69/400))/80 - (6*exp(-69/400)*sin(391/2000))/25, - (153*cos(51/250)*exp(-9/50))/80 - (6*exp(-9/50)*sin(51/250))/25, - (153*cos(17/80)*exp(-3/16))/80 - (6*exp(-3/16)*sin(17/80))/25, - (153*cos(221/1000)*exp(-39/200))/80 - (6*exp(-39/200)*sin(221/1000))/25, - (153*cos(459/2000)*exp(-81/400))/80 - (6*exp(-81/400)*sin(459/2000))/25, - (153*cos(119/500)*exp(-21/100))/80 - (6*exp(-21/100)*sin(119/500))/25, - (153*cos(493/2000)*exp(-87/400))/80 - (6*exp(-87/400)*sin(493/2000))/25, - (153*cos(51/200)*exp(-9/40))/80 - (6*exp(-9/40)*sin(51/200))/25, - (153*cos(527/2000)*exp(-93/400))/80 - (6*exp(-93/400)*sin(527/2000))/25, - (153*cos(34/125)*exp(-6/25))/80 - (6*exp(-6/25)*sin(34/125))/25, -

(153*cos(561/2000)*exp(-99/400))/80 - (6*exp(-99/400)*sin(561/2000))/25, - (153*cos(289/1000)*exp(-51/200))/80 - (6*exp(-51/200)*sin(289/1000))/25, - (153*cos(119/400)*exp(-21/80))/80 - (6*exp(-21/80)*sin(119/400))/25, - (153*cos(153/500)*exp(-27/100))/80 - (6*exp(-27/100)*sin(153/500))/25, - (153*cos(629/2000)*exp(-111/400))/80 - (6*exp(-111/400)*sin(629/2000))/25, - (153*cos(323/1000)*exp(-57/200))/80 - (6*exp(-57/200)*sin(323/1000))/25, - (153*cos(663/2000)*exp(-117/400))/80 - (6*exp(-117/400)*sin(663/2000))/25, - (153*cos(17/50)*exp(-3/10))/80 - (6*exp(-3/10)*sin(17/50))/25, - (153*cos(697/2000)*exp(-123/400))/80 - (6*exp(-123/400)*sin(697/2000))/25, - (153*cos(357/1000)*exp(-63/200))/80 - (6*exp(-63/200)*sin(357/1000))/25, - (153*cos(731/2000)*exp(-129/400))/80 - (6*exp(-129/400)*sin(731/2000))/25, - (153*cos(187/500)*exp(-33/100))/80 - (6*exp(-33/100)*sin(187/500))/25, - (153*cos(153/400)*exp(-27/80))/80 - (6*exp(-27/80)*sin(153/400))/25, - (153*cos(391/1000)*exp(-69/200))/80 - (6*exp(-69/200)*sin(391/1000))/25, - (153*cos(799/2000)*exp(-141/400))/80 - (6*exp(-141/400)*sin(799/2000))/25, - (153*cos(51/125)*exp(-9/25))/80 - (6*exp(-9/25)*sin(51/125))/25, - (153*cos(833/2000)*exp(-147/400))/80 - (6*exp(-147/400)*sin(833/2000))/25, - (153*cos(17/40)*exp(-3/8))/80 - (6*exp(-3/8)*sin(17/40))/25, - (153*cos(867/2000)*exp(-153/400))/80 - (6*exp(-153/400)*sin(867/2000))/25, - (153*cos(221/500)*exp(-39/100))/80 - (6*exp(-39/100)*sin(221/500))/25, - (153*cos(901/2000)*exp(-159/400))/80 - (6*exp(-159/400)*sin(901/2000))/25, - (153*cos(459/1000)*exp(-81/200))/80 - (6*exp(-81/200)*sin(459/1000))/25, - (153*cos(187/400)*exp(-33/80))/80 - (6*exp(-33/80)*sin(187/400))/25, - (153*cos(119/250)*exp(-21/50))/80 - (6*exp(-21/50)*sin(119/250))/25, - (153*cos(969/2000)*exp(-171/400))/80 - (6*exp(-

171/400)*sin(969/2000))/25, - (153*cos(493/1000)*exp(-87/200))/80 - (6*exp(-87/200)*sin(493/1000))/25, - (153*cos(1003/2000)*exp(-177/400))/80 - (6*exp(-177/400)*sin(1003/2000))/25, - (153*cos(51/100)*exp(-9/20))/80 - (6*exp(-9/20)*sin(51/100))/25, - (153*cos(1037/2000)*exp(-183/400))/80 - (6*exp(-183/400)*sin(1037/2000))/25, - (153*cos(527/1000)*exp(-93/200))/80 - (6*exp(-93/200)*sin(527/1000))/25, - (153*cos(1071/2000)*exp(-189/400))/80 - (6*exp(-189/400)*sin(1071/2000))/25, - (153*cos(68/125)*exp(-12/25))/80 - (6*exp(-12/25)*sin(68/125))/25, - (153*cos(221/400)*exp(-39/80))/80 - (6*exp(-39/80)*sin(221/400))/25, - (153*cos(561/1000)*exp(-99/200))/80 - (6*exp(-99/200)*sin(561/1000))/25, - (153*cos(1139/2000)*exp(-201/400))/80 - (6*exp(-201/400)*sin(1139/2000))/25, - (153*cos(289/500)*exp(-51/100))/80 - (6*exp(-51/100)*sin(289/500))/25, - (153*cos(1173/2000)*exp(-207/400))/80 - (6*exp(-207/400)*sin(1173/2000))/25, - (153*cos(119/200)*exp(-21/40))/80 - (6*exp(-21/40)*sin(119/200))/25, - (153*cos(1207/2000)*exp(-213/400))/80 - (6*exp(-213/400)*sin(1207/2000))/25, - (153*cos(153/250)*exp(-27/50))/80 - (6*exp(-27/50)*sin(153/250))/25, - (153*cos(1241/2000)*exp(-219/400))/80 - (6*exp(-219/400)*sin(1241/2000))/25, - (153*cos(629/1000)*exp(-111/200))/80 - (6*exp(-111/200)*sin(629/1000))/25, - (153*cos(51/80)*exp(-9/16))/80 - (6*exp(-9/16)*sin(51/80))/25, - (153*cos(323/500)*exp(-57/100))/80 - (6*exp(-57/100)*sin(323/500))/25, - (153*cos(1309/2000)*exp(-231/400))/80 - (6*exp(-231/400)*sin(1309/2000))/25, - (153*cos(663/1000)*exp(-117/200))/80 - (6*exp(-117/200)*sin(663/1000))/25, - (153*cos(1343/2000)*exp(-237/400))/80 - (6*exp(-237/400)*sin(1343/2000))/25, - (153*cos(17/25)*exp(-3/5))/80 - (6*exp(-3/5)*sin(17/25))/25, - (153*cos(1377/2000)*exp(-243/400))/80 - (6*exp(-

243/400)*sin(1377/2000))/25, - (153*cos(697/1000)*exp(-123/200))/80 - (6*exp(-123/200)*sin(697/1000))/25, - (153*cos(1411/2000)*exp(-249/400))/80 - (6*exp(-249/400)*sin(1411/2000))/25, - (153*cos(357/500)*exp(-63/100))/80 - (6*exp(-63/100)*sin(357/500))/25, - (153*cos(289/400)*exp(-51/80))/80 - (6*exp(-51/80)*sin(289/400))/25, - (153*cos(731/1000)*exp(-129/200))/80 - (6*exp(-129/200)*sin(731/1000))/25, - (153*cos(1479/2000)*exp(-261/400))/80 - (6*exp(-261/400)*sin(1479/2000))/25, - (153*cos(187/250)*exp(-33/50))/80 - (6*exp(-33/50)*sin(187/250))/25, - (153*cos(1513/2000)*exp(-267/400))/80 - (6*exp(-267/400)*sin(1513/2000))/25, - (153*cos(153/200)*exp(-27/40))/80 - (6*exp(-27/40)*sin(153/200))/25, - (153*cos(1547/2000)*exp(-273/400))/80 - (6*exp(-273/400)*sin(1547/2000))/25, - (153*cos(391/500)*exp(-69/100))/80 - (6*exp(-69/100)*sin(391/500))/25, - (153*cos(1581/2000)*exp(-279/400))/80 - (6*exp(-279/400)*sin(1581/2000))/25, - (153*cos(799/1000)*exp(-141/200))/80 - (6*exp(-141/200)*sin(799/1000))/25, - (153*cos(323/400)*exp(-57/80))/80 - (6*exp(-57/80)*sin(323/400))/25, - (153*cos(102/125)*exp(-18/25))/80 - (6*exp(-18/25)*sin(102/125))/25, - (153*cos(1649/2000)*exp(-291/400))/80 - (6*exp(-291/400)*sin(1649/2000))/25, - (153*cos(833/1000)*exp(-147/200))/80 - (6*exp(-147/200)*sin(833/1000))/25, - (153*cos(1683/2000)*exp(-297/400))/80 - (6*exp(-297/400)*sin(1683/2000))/25, - (153*cos(17/20)*exp(-3/4))/80 - (6*exp(-3/4)*sin(17/20))/25, - (153*cos(1717/2000)*exp(-303/400))/80 - (6*exp(-303/400)*sin(1717/2000))/25, - (153*cos(867/1000)*exp(-153/200))/80 - (6*exp(-153/200)*sin(867/1000))/25, - (153*cos(1751/2000)*exp(-309/400))/80 - (6*exp(-309/400)*sin(1751/2000))/25, - (153*cos(221/250)*exp(-39/50))/80 - (6*exp(-39/50)*sin(221/250))/25, - (153*cos(357/400)*exp(-

63/80))/80 - (6*exp(-63/80)*sin(357/400))/25, -(153*cos(901/1000)*exp(-159/200))/80 - (6*exp(-159/200)*sin(901/1000))/25, - (153*cos(1819/2000)*exp(-321/400))/80 - (6*exp(-321/400)*sin(1819/2000))/25, -(153*cos(459/500)*exp(-81/100))/80 - (6*exp(-81/100)*sin(459/500))/25, - (153*cos(1853/2000)*exp(-327/400))/80 - (6*exp(-327/400)*sin(1853/2000))/25, -(153*cos(187/200)*exp(-33/40))/80 - (6*exp(-33/40)*sin(187/200))/25, - (153*cos(1887/2000)*exp(-333/400))/80 - (6*exp(-333/400)*sin(1887/2000))/25, - (153*cos(119/125)*exp(-21/25))/80 - (6*exp(-21/25)*sin(119/125))/25, -(153*cos(1921/2000)*exp(-339/400))/80 - (6*exp(-339/400)*sin(1921/2000))/25, - (153*cos(969/1000)*exp(-171/200))/80 - (6*exp(-171/200)*sin(969/1000))/25, -(153*cos(391/400)*exp(-69/80))/80 - (6*exp(-69/80)*sin(391/400))/25, - (153*cos(493/500)*exp(-87/100))/80 - (6*exp(-87/100)*sin(493/500))/25, - (153*cos(1989/2000)*exp(-351/400))/80 - (6*exp(-351/400)*sin(1989/2000))/25, -(153*cos(1003/1000)*exp(-177/200))/80 - (6*exp(-177/200)*sin(1003/1000))/25, - (153*cos(2023/2000)*exp(-357/400))/80 - (6*exp(-357/400)*sin(2023/2000))/25, -(153*cos(51/50)*exp(-9/10))/80 - (6*exp(-9/10)*sin(51/50))/25, -(153*cos(2057/2000)*exp(-363/400))/80 - (6*exp(-363/400)*sin(2057/2000))/25, - (153*cos(1037/1000)*exp(-183/200))/80 - (6*exp(-183/200)*sin(1037/1000))/25, -(153*cos(2091/2000)*exp(-369/400))/80 - (6*exp(-369/400)*sin(2091/2000))/25, - (153*cos(527/500)*exp(-93/100))/80 - (6*exp(-93/100)*sin(527/500))/25, -(153*cos(17/16)*exp(-15/16))/80 - (6*exp(-15/16)*sin(17/16))/25, -(153*cos(1071/1000)*exp(-189/200))/80 - (6*exp(-189/200)*sin(1071/1000))/25, - (153*cos(2159/2000)*exp(-381/400))/80 - (6*exp(-381/400)*sin(2159/2000))/25, -(153*cos(136/125)*exp(-24/25))/80 - (6*exp(-

24/25)*sin(136/125))/25, - (153*cos(2193/2000)*exp(-387/400))/80 - (6*exp(-387/400)*sin(2193/2000))/25, - (153*cos(221/200)*exp(-39/40))/80 - (6*exp(-39/40)*sin(221/200))/25, - (153*cos(2227/2000)*exp(-393/400))/80 - (6*exp(-393/400)*sin(2227/2000))/25, - (153*cos(561/500)*exp(-99/100))/80 - (6*exp(-99/100)*sin(561/500))/25, - (153*cos(2261/2000)*exp(-399/400))/80 - (6*exp(-399/400)*sin(2261/2000))/25, - (153*cos(1139/1000)*exp(-201/200))/80 - (6*exp(-201/200)*sin(1139/1000))/25, - (153*cos(459/400)*exp(-81/80))/80 - (6*exp(-81/80)*sin(459/400))/25, - (153*cos(289/250)*exp(-51/50))/80 - (6*exp(-51/50)*sin(289/250))/25, - (153*cos(2329/2000)*exp(-411/400))/80 - (6*exp(-411/400)*sin(2329/2000))/25, - (153*cos(1173/1000)*exp(-207/200))/80 - (6*exp(-207/200)*sin(1173/1000))/25, - (153*cos(2363/2000)*exp(-417/400))/80 - (6*exp(-417/400)*sin(2363/2000))/25, - (153*cos(119/100)*exp(-21/20))/80 - (6*exp(-21/20)*sin(119/100))/25, - (153*cos(2397/2000)*exp(-423/400))/80 - (6*exp(-423/400)*sin(2397/2000))/25, - (153*cos(1207/1000)*exp(-213/200))/80 - (6*exp(-213/200)*sin(1207/1000))/25, - (153*cos(2431/2000)*exp(-429/400))/80 - (6*exp(-429/400)*sin(2431/2000))/25, - (153*cos(153/125)*exp(-27/25))/80 - (6*exp(-27/25)*sin(153/125))/25, - (153*cos(493/400)*exp(-87/80))/80 - (6*exp(-87/80)*sin(493/400))/25, - (153*cos(1241/1000)*exp(-219/200))/80 - (6*exp(-219/200)*sin(1241/1000))/25, - (153*cos(2499/2000)*exp(-441/400))/80 - (6*exp(-441/400)*sin(2499/2000))/25, - (153*cos(629/500)*exp(-111/100))/80 - (6*exp(-111/100)*sin(629/500))/25, - (153*cos(2533/2000)*exp(-447/400))/80 - (6*exp(-447/400)*sin(2533/2000))/25, - (153*cos(51/40)*exp(-9/8))/80 - (6*exp(-9/8)*sin(51/40))/25, - (153*cos(2567/2000)*exp(-453/400))/80 - (6*exp(-453/400)*sin(2567/2000))/25, -

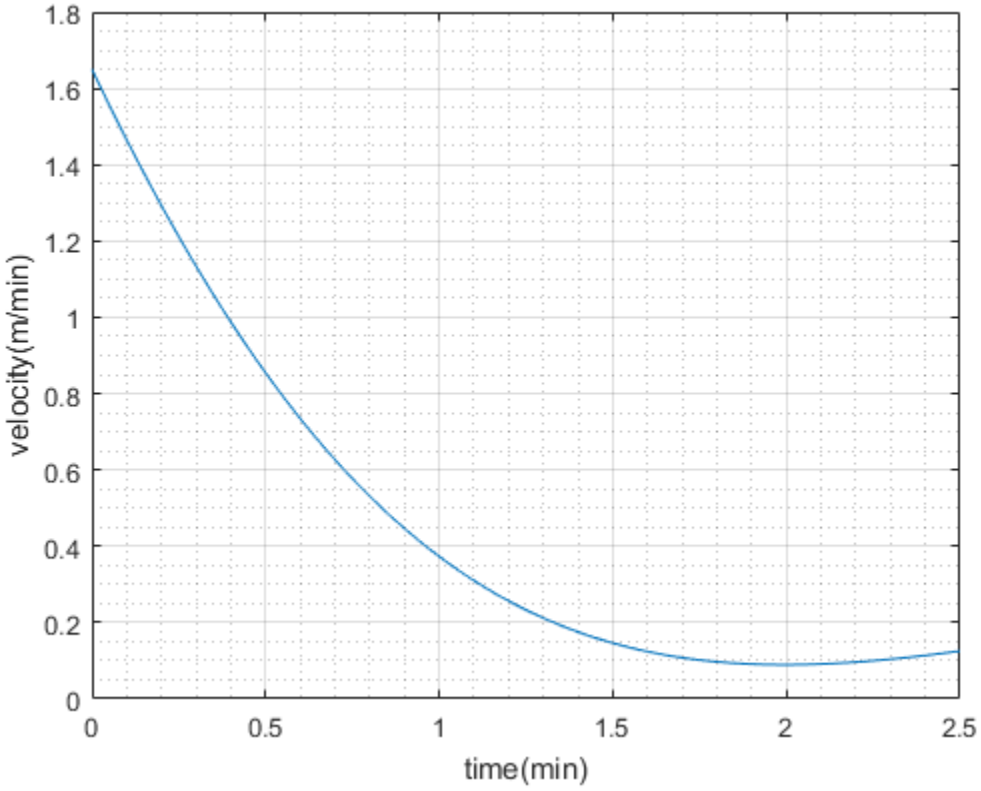
(153*cos(323/250)*exp(-57/50))/80 - (6*exp(-57/50)*sin(323/250))/25, - (153*cos(2601/2000)*exp(-459/400))/80 - (6*exp(-459/400)*sin(2601/2000))/25, - (153*cos(1309/1000)*exp(-231/200))/80 - (6*exp(-231/200)*sin(1309/1000))/25, - (153*cos(527/400)*exp(-93/80))/80 - (6*exp(-93/80)*sin(527/400))/25, - (153*cos(663/500)*exp(-117/100))/80 - (6*exp(-117/100)*sin(663/500))/25, - (153*cos(2669/2000)*exp(-471/400))/80 - (6*exp(-471/400)*sin(2669/2000))/25, - (153*cos(1343/1000)*exp(-237/200))/80 - (6*exp(-237/200)*sin(1343/1000))/25, - (153*cos(2703/2000)*exp(-477/400))/80 - (6*exp(-477/400)*sin(2703/2000))/25, - (153*cos(34/25)*exp(-6/5))/80 - (6*exp(-6/5)*sin(34/25))/25, - (153*cos(2737/2000)*exp(-483/400))/80 - (6*exp(-483/400)*sin(2737/2000))/25, - (153*cos(1377/1000)*exp(-243/200))/80 - (6*exp(-243/200)*sin(1377/1000))/25, - (153*cos(2771/2000)*exp(-489/400))/80 - (6*exp(-489/400)*sin(2771/2000))/25, - (153*cos(697/500)*exp(-123/100))/80 - (6*exp(-123/100)*sin(697/500))/25, - (153*cos(561/400)*exp(-99/80))/80 - (6*exp(-99/80)*sin(561/400))/25, - (153*cos(1411/1000)*exp(-249/200))/80 - (6*exp(-249/200)*sin(1411/1000))/25, - (153*cos(2839/2000)*exp(-501/400))/80 - (6*exp(-501/400)*sin(2839/2000))/25, - (153*cos(357/250)*exp(-63/50))/80 - (6*exp(-63/50)*sin(357/250))/25, - (153*cos(2873/2000)*exp(-507/400))/80 - (6*exp(-507/400)*sin(2873/2000))/25, - (153*cos(289/200)*exp(-51/40))/80 - (6*exp(-51/40)*sin(289/200))/25, - (153*cos(2907/2000)*exp(-513/400))/80 - (6*exp(-513/400)*sin(2907/2000))/25, - (153*cos(731/500)*exp(-129/100))/80 - (6*exp(-129/100)*sin(731/500))/25, - (153*cos(2941/2000)*exp(-519/400))/80 - (6*exp(-519/400)*sin(2941/2000))/25, - (153*cos(1479/1000)*exp(-261/200))/80 - (6*exp(-261/200)*sin(1479/1000))/25, - (153*cos(119/80)*exp(-21/16))/80 - (6*exp(-

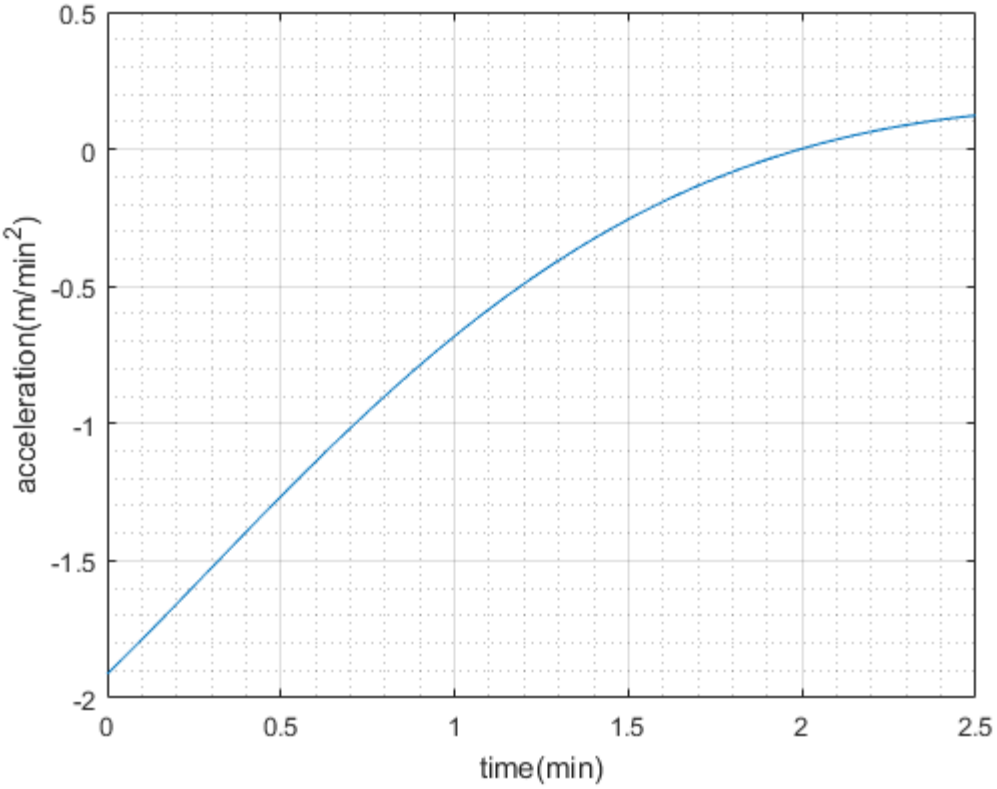
21/16)*sin(119/80))/25, - (153*cos(187/125)*exp(-33/25))/80 - (6*exp(-33/25)*sin(187/125))/25, - (153*cos(3009/2000)*exp(-531/400))/80 - (6*exp(-531/400)*sin(3009/2000))/25, - (153*cos(1513/1000)*exp(-267/200))/80 - (6*exp(-267/200)*sin(1513/1000))/25, - (153*cos(3043/2000)*exp(-537/400))/80 - (6*exp(-537/400)*sin(3043/2000))/25, - (153*cos(153/100)*exp(-27/20))/80 - (6*exp(-27/20)*sin(153/100))/25, - (153*cos(3077/2000)*exp(-543/400))/80 - (6*exp(-543/400)*sin(3077/2000))/25, - (153*cos(1547/1000)*exp(-273/200))/80 - (6*exp(-273/200)*sin(1547/1000))/25, - (153*cos(3111/2000)*exp(-549/400))/80 - (6*exp(-549/400)*sin(3111/2000))/25, - (153*cos(391/250)*exp(-69/50))/80 - (6*exp(-69/50)*sin(391/250))/25, - (153*cos(629/400)*exp(-111/80))/80 - (6*exp(-111/80)*sin(629/400))/25, - (153*cos(1581/1000)*exp(-279/200))/80 - (6*exp(-279/200)*sin(1581/1000))/25, - (153*cos(3179/2000)*exp(-561/400))/80 - (6*exp(-561/400)*sin(3179/2000))/25, - (153*cos(799/500)*exp(-141/100))/80 - (6*exp(-141/100)*sin(799/500))/25, - (153*cos(3213/2000)*exp(-567/400))/80 - (6*exp(-567/400)*sin(3213/2000))/25, - (153*cos(323/200)*exp(-57/40))/80 - (6*exp(-57/40)*sin(323/200))/25, - (153*cos(3247/2000)*exp(-573/400))/80 - (6*exp(-573/400)*sin(3247/2000))/25, - (153*cos(204/125)*exp(-36/25))/80 - (6*exp(-36/25)*sin(204/125))/25, - (153*cos(3281/2000)*exp(-579/400))/80 - (6*exp(-579/400)*sin(3281/2000))/25, - (153*cos(1649/1000)*exp(-291/200))/80 - (6*exp(-291/200)*sin(1649/1000))/25, - (153*cos(663/400)*exp(-117/80))/80 - (6*exp(-117/80)*sin(663/400))/25, - (153*cos(833/500)*exp(-147/100))/80 - (6*exp(-147/100)*sin(833/500))/25, - (153*cos(3349/2000)*exp(-591/400))/80 - (6*exp(-591/400)*sin(3349/2000))/25, - (153*cos(1683/1000)*exp(-297/200))/80 - (6*exp(-

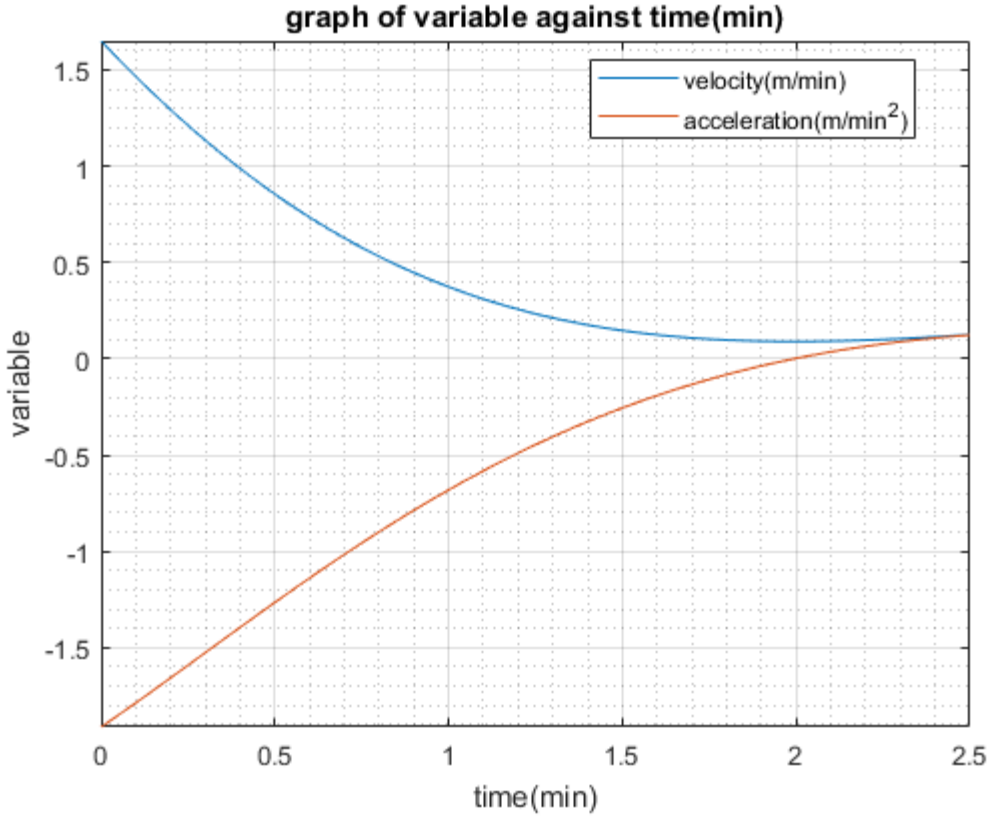
297/200)*sin(1683/1000))/25, - (153*cos(3383/2000)*exp(-597/400))/80 - (6*exp(-597/400)*sin(3383/2000))/25, - (153*cos(17/10)*exp(-3/2))/80 - (6*exp(-3/2)*sin(17/10))/25, - (153*cos(3417/2000)*exp(-603/400))/80 - (6*exp(-603/400)*sin(3417/2000))/25, - (153*cos(1717/1000)*exp(-303/200))/80 - (6*exp(-303/200)*sin(1717/1000))/25, - (153*cos(3451/2000)*exp(-609/400))/80 - (6*exp(-609/400)*sin(3451/2000))/25, - (153*cos(867/500)*exp(-153/100))/80 - (6*exp(-153/100)*sin(867/500))/25, - (153*cos(697/400)*exp(-123/80))/80 - (6*exp(-123/80)*sin(697/400))/25, - (153*cos(1751/1000)*exp(-309/200))/80 - (6*exp(-309/200)*sin(1751/1000))/25, - (153*cos(3519/2000)*exp(-621/400))/80 - (6*exp(-621/400)*sin(3519/2000))/25, - (153*cos(221/125)*exp(-39/25))/80 - (6*exp(-39/25)*sin(221/125))/25, - (153*cos(3553/2000)*exp(-627/400))/80 - (6*exp(-627/400)*sin(3553/2000))/25, - (153*cos(357/200)*exp(-63/40))/80 - (6*exp(-63/40)*sin(357/200))/25, - (153*cos(3587/2000)*exp(-633/400))/80 - (6*exp(-633/400)*sin(3587/2000))/25, - (153*cos(901/500)*exp(-159/100))/80 - (6*exp(-159/100)*sin(901/500))/25, - (153*cos(3621/2000)*exp(-639/400))/80 - (6*exp(-639/400)*sin(3621/2000))/25, - (153*cos(1819/1000)*exp(-321/200))/80 - (6*exp(-321/200)*sin(1819/1000))/25, - (153*cos(731/400)*exp(-129/80))/80 - (6*exp(-129/80)*sin(731/400))/25, - (153*cos(459/250)*exp(-81/50))/80 - (6*exp(-81/50)*sin(459/250))/25, - (153*cos(3689/2000)*exp(-651/400))/80 - (6*exp(-651/400)*sin(3689/2000))/25, - (153*cos(1853/1000)*exp(-327/200))/80 - (6*exp(-327/200)*sin(1853/1000))/25, - (153*cos(3723/2000)*exp(-657/400))/80 - (6*exp(-657/400)*sin(3723/2000))/25, - (153*cos(187/100)*exp(-33/20))/80 - (6*exp(-33/20)*sin(187/100))/25, - (153*cos(3757/2000)*exp(-663/400))/80 - (6*exp(-663/400)*sin(3757/2000))/25, -

(153*cos(1887/1000)*exp(-333/200))/80 - (6*exp(-333/200)*sin(1887/1000))/25, - (153*cos(3791/2000)*exp(-669/400))/80 - (6*exp(-669/400)*sin(3791/2000))/25, - (153*cos(238/125)*exp(-42/25))/80 - (6*exp(-42/25)*sin(238/125))/25, - (153*cos(153/80)*exp(-27/16))/80 - (6*exp(-27/16)*sin(153/80))/25, - (153*cos(1921/1000)*exp(-339/200))/80 - (6*exp(-339/200)*sin(1921/1000))/25, - (153*cos(3859/2000)*exp(-681/400))/80 - (6*exp(-681/400)*sin(3859/2000))/25, - (153*cos(969/500)*exp(-171/100))/80 - (6*exp(-171/100)*sin(969/500))/25, - (153*cos(3893/2000)*exp(-687/400))/80 - (6*exp(-687/400)*sin(3893/2000))/25, - (153*cos(391/200)*exp(-69/40))/80 - (6*exp(-69/40)*sin(391/200))/25, - (153*cos(3927/2000)*exp(-693/400))/80 - (6*exp(-693/400)*sin(3927/2000))/25, - (153*cos(493/250)*exp(-87/50))/80 - (6*exp(-87/50)*sin(493/250))/25, - (153*cos(3961/2000)*exp(-699/400))/80 - (6*exp(-699/400)*sin(3961/2000))/25, - (153*cos(1989/1000)*exp(-351/200))/80 - (6*exp(-351/200)*sin(1989/1000))/25, - (153*cos(799/400)*exp(-141/80))/80 - (6*exp(-141/80)*sin(799/400))/25, - (153*cos(1003/500)*exp(-177/100))/80 - (6*exp(-177/100)*sin(1003/500))/25, - (153*cos(4029/2000)*exp(-711/400))/80 - (6*exp(-711/400)*sin(4029/2000))/25, - (153*cos(2023/1000)*exp(-357/200))/80 - (6*exp(-357/200)*sin(2023/1000))/25, - (153*cos(4063/2000)*exp(-717/400))/80 - (6*exp(-717/400)*sin(4063/2000))/25, - (153*cos(51/25)*exp(-9/5))/80 - (6*exp(-9/5)*sin(51/25))/25, - (153*cos(4097/2000)*exp(-723/400))/80 - (6*exp(-723/400)*sin(4097/2000))/25, - (153*cos(2057/1000)*exp(-363/200))/80 - (6*exp(-363/200)*sin(2057/1000))/25, - (153*cos(4131/2000)*exp(-729/400))/80 - (6*exp(-729/400)*sin(4131/2000))/25, - (153*cos(1037/500)*exp(-183/100))/80 - (6*exp(-183/100)*sin(1037/500))/25, -

(153*cos(833/400)*exp(-147/80))/80 - (6*exp(-147/80)*sin(833/400))/25, - (153*cos(2091/1000)*exp(-369/200))/80 - (6*exp(-369/200)*sin(2091/1000))/25, - (153*cos(4199/2000)*exp(-741/400))/80 - (6*exp(-741/400)*sin(4199/2000))/25, - (153*cos(527/250)*exp(-93/50))/80 - (6*exp(-93/50)*sin(527/250))/25, - (153*cos(4233/2000)*exp(-747/400))/80 - (6*exp(-747/400)*sin(4233/2000))/25, - (153*cos(17/8)*exp(-15/8))/80 - (6*exp(-15/8)*sin(17/8))/25]




0.5
0
-0.5
-1
-1.5
-2
0
0.5
1
1.5
2
2.5
acceleration(m/min^2)
time(min)


graph of variable against time(min)
velocity(m/min)
acceleration(m/min^2)
1.5
1
0.5
0
-0.5
-1
-1.5
0
0.5
1
1.5
2
2.5
variable
time(min)

c)

CODES;

```
1. commandwindow
2. clear
3. clc
4. syms x
5. y=5*sin(5*x)^5
6. Y=y^2
7. ZY=int(Y)*pi
8. dint=int(ZY,0,pi)
9. zm=double(dint)
10.        format longg
```

COMMAND WINDOW(OUTPUT)

```
y =

5*sin(5*x)^5


Y =

25*sin(5*x)^10


ZY =

pi*((1575*x)/256 - (525*sin(10*x))/512 + (75*sin(20*x))/256 -
(75*sin(30*x))/1024 + (25*sin(40*x))/2048 - sin(50*x)/1024)
```

```
dint =

(1575*pi^3)/512


zm =

    95.381

>>
```