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Matric. No: 16/ENG04/007

Department: Electrical/Electronics Engineering

QUESTION 4

a) 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]
Sola = inv(A)
Tobi = Sola*B
w= Tobi (1,1)
x= Tobi (2,1)
y= Tobi (3,1)
z= Tobi (4,1)

OUTPUT

A = 0 10 4 -2
 -3 -17 1 2
 1 1 1 0
 8 -34 16 -10

B = -4
 2
 6
 4

Sola = -0.17857 -0.1020 0.5714 0.0153
 0.03571 -0.0153 0.0357 -0.010
 0.1428 0.1173 0.3928 -0.0051
 -0.0357 0.1581 0.9642 -0.0612

Tobi = 4
 -0
 2
 6

Answer

```
w = 4  
x = -0  
y = 2  
z = 6
```

b) commandwindow

```
clear  
clc  
close all  
syms t  
d = 1.5*exp(-0.75*t)*sin(0.85*t)+0.375*t  
fn = [0:0.01:2.5]  
v=diff(d)  
sn=subs (v,fn)  
figure(1)  
plot(fn,sn)  
xlabel('time(min)');  
ylabel('velocity(m/min)');  
grid on;  
grid minor;  
a=diff(v)  
an=subs (a,fn)  
figure(2)  
plot(fn,an)  
xlabel('time(min)');  
ylabel('acceleration(m/min^2)');  
grid on;  
grid minor;  
figure (3)  
plot(tn,sn,fn,an)  
axis tight  
xlabel('time(min)')  
ylabel('variable')  
grid on  
grid minor  
legend('velocity(m/min)', 'acceleration(m/min^2)', 'location', 'best')
```

OUTPUT

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

fn =

Columns 1 through 4

0	0.01	0.02	0.03
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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 =

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

sn =

$$\begin{aligned} & [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, \end{aligned}$$

$(51 \cdot \cos(357/1000) \cdot \exp(-63/200))/40 - (9 \cdot \exp(-63/200) \cdot \sin(357/1000))/8 + 3/8,$
 $(51 \cdot \cos(731/2000) \cdot \exp(-129/400))/40 - (9 \cdot \exp(-129/400) \cdot \sin(731/2000))/8 + 3/8,$
 $(51 \cdot \cos(187/500) \cdot \exp(-33/100))/40 - (9 \cdot \exp(-33/100) \cdot \sin(187/500))/8 + 3/8,$
 $(51 \cdot \cos(153/400) \cdot \exp(-27/80))/40 - (9 \cdot \exp(-27/80) \cdot \sin(153/400))/8 + 3/8,$
 $(51 \cdot \cos(391/1000) \cdot \exp(-69/200))/40 - (9 \cdot \exp(-69/200) \cdot \sin(391/1000))/8 + 3/8,$
 $(51 \cdot \cos(799/2000) \cdot \exp(-141/400))/40 - (9 \cdot \exp(-141/400) \cdot \sin(799/2000))/8 + 3/8,$
 $(51 \cdot \cos(51/125) \cdot \exp(-9/25))/40 - (9 \cdot \exp(-9/25) \cdot \sin(51/125))/8 + 3/8,$
 $(51 \cdot \cos(833/2000) \cdot \exp(-147/400))/40 - (9 \cdot \exp(-147/400) \cdot \sin(833/2000))/8 + 3/8,$
 $(51 \cdot \cos(17/40) \cdot \exp(-3/8))/40 - (9 \cdot \exp(-3/8) \cdot \sin(17/40))/8 + 3/8, (51 \cdot \cos(867/2000) \cdot \exp(-153/400))/40 - (9 \cdot \exp(-153/400) \cdot \sin(867/2000))/8 + 3/8, (51 \cdot \cos(221/500) \cdot \exp(-39/100))/40 - (9 \cdot \exp(-39/100) \cdot \sin(221/500))/8 + 3/8, (51 \cdot \cos(901/2000) \cdot \exp(-159/400))/40 - (9 \cdot \exp(-159/400) \cdot \sin(901/2000))/8 + 3/8, (51 \cdot \cos(459/1000) \cdot \exp(-81/200))/40 - (9 \cdot \exp(-81/200) \cdot \sin(459/1000))/8 + 3/8, (51 \cdot \cos(187/400) \cdot \exp(-33/80))/40 - (9 \cdot \exp(-33/80) \cdot \sin(187/400))/8 + 3/8, (51 \cdot \cos(119/250) \cdot \exp(-21/50))/40 - (9 \cdot \exp(-21/50) \cdot \sin(119/250))/8 + 3/8, (51 \cdot \cos(969/2000) \cdot \exp(-171/400))/40 - (9 \cdot \exp(-171/400) \cdot \sin(969/2000))/8 + 3/8, (51 \cdot \cos(493/1000) \cdot \exp(-87/200))/40 - (9 \cdot \exp(-87/200) \cdot \sin(493/1000))/8 + 3/8, (51 \cdot \cos(1003/2000) \cdot \exp(-177/400))/40 - (9 \cdot \exp(-177/400) \cdot \sin(1003/2000))/8 + 3/8, (51 \cdot \cos(51/100) \cdot \exp(-9/20))/40 - (9 \cdot \exp(-9/20) \cdot \sin(51/100))/8 + 3/8, (51 \cdot \cos(1037/2000) \cdot \exp(-183/400))/40 - (9 \cdot \exp(-183/400) \cdot \sin(1037/2000))/8 + 3/8, (51 \cdot \cos(527/1000) \cdot \exp(-93/200))/40 - (9 \cdot \exp(-93/200) \cdot \sin(527/1000))/8 + 3/8, (51 \cdot \cos(1071/2000) \cdot \exp(-189/400))/40 - (9 \cdot \exp(-189/400) \cdot \sin(1071/2000))/8 + 3/8, (51 \cdot \cos(68/125) \cdot \exp(-12/25))/40 - (9 \cdot \exp(-12/25) \cdot \sin(68/125))/8 + 3/8, (51 \cdot \cos(221/400) \cdot \exp(-39/80))/40 - (9 \cdot \exp(-39/80) \cdot \sin(221/400))/8 + 3/8, (51 \cdot \cos(561/1000) \cdot \exp(-99/200))/40 - (9 \cdot \exp(-99/200) \cdot \sin(561/1000))/8 + 3/8, (51 \cdot \cos(1139/2000) \cdot \exp(-201/400))/40 - (9 \cdot \exp(-201/400) \cdot \sin(1139/2000))/8 + 3/8, (51 \cdot \cos(289/500) \cdot \exp(-51/100))/40 - (9 \cdot \exp(-51/100) \cdot \sin(289/500))/8 + 3/8, (51 \cdot \cos(1173/2000) \cdot \exp(-207/400))/40 - (9 \cdot \exp(-207/400) \cdot \sin(1173/2000))/8 + 3/8, (51 \cdot \cos(119/200) \cdot \exp(-21/40))/40 - (9 \cdot \exp(-21/40) \cdot \sin(119/200))/8 + 3/8, (51 \cdot \cos(1207/2000) \cdot \exp(-213/400))/40 - (9 \cdot \exp(-213/400) \cdot \sin(1207/2000))/8 + 3/8, (51 \cdot \cos(153/250) \cdot \exp(-27/50))/40 - (9 \cdot \exp(-27/50) \cdot \sin(153/250))/8 + 3/8, (51 \cdot \cos(1241/2000) \cdot \exp(-219/400))/40 - (9 \cdot \exp(-219/400) \cdot \sin(1241/2000))/8 + 3/8, (51 \cdot \cos(629/1000) \cdot \exp(-111/200))/40 - (9 \cdot \exp(-111/200) \cdot \sin(629/1000))/8 + 3/8, (51 \cdot \cos(51/80) \cdot \exp(-9/16))/40 - (9 \cdot \exp(-9/16) \cdot \sin(51/80))/8 + 3/8, (51 \cdot \cos(323/500) \cdot \exp(-57/100))/40 - (9 \cdot \exp(-57/100) \cdot \sin(323/500))/8 + 3/8, (51 \cdot \cos(1309/2000) \cdot \exp(-231/400))/40 - (9 \cdot \exp(-231/400) \cdot \sin(1309/2000))/8 + 3/8, (51 \cdot \cos(663/1000) \cdot \exp(-117/200))/40 - (9 \cdot \exp(-117/200) \cdot \sin(663/1000))/8 + 3/8, (51 \cdot \cos(1343/2000) \cdot \exp(-237/400))/40 - (9 \cdot \exp(-237/400) \cdot \sin(1343/2000))/8 + 3/8, (51 \cdot \cos(17/25) \cdot \exp(-3/5))/40 - (9 \cdot \exp(-3/5) \cdot \sin(17/25))/8 + 3/8, (51 \cdot \cos(1377/2000) \cdot \exp(-243/400))/40 - (9 \cdot \exp(-243/400) \cdot \sin(1377/2000))/8 + 3/8, (51 \cdot \cos(697/1000) \cdot \exp(-123/200))/40 - (9 \cdot \exp(-123/200) \cdot \sin(697/1000))/8 + 3/8, (51 \cdot \cos(1411/2000) \cdot \exp(-249/400))/40 - (9 \cdot \exp(-249/400) \cdot \sin(1411/2000))/8 + 3/8, (51 \cdot \cos(357/500) \cdot \exp(-63/100))/40 - (9 \cdot \exp(-63/100) \cdot \sin(357/500))/8 + 3/8, (51 \cdot \cos(289/400) \cdot \exp(-51/80))/40 - (9 \cdot \exp(-51/80) \cdot \sin(289/400))/8 + 3/8, (51 \cdot \cos(731/1000) \cdot \exp(-129/200))/40 - (9 \cdot \exp(-129/200) \cdot \sin(731/1000))/8 + 3/8,$

$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(-$

$$\begin{aligned}
& 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(-
\end{aligned}$$

$$\begin{aligned}
& 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(-
\end{aligned}$$

$$\begin{aligned}
& 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]
\end{aligned}$$

a =

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

an =

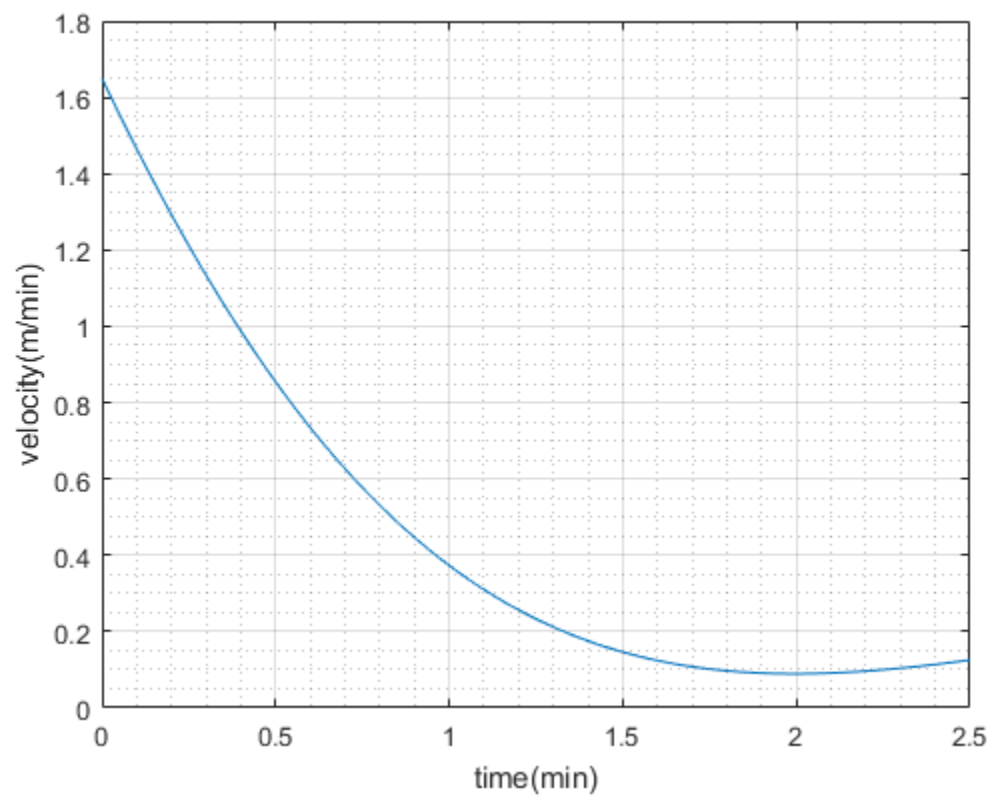
$$\begin{aligned}
& [-153/80, - (153*\cos(17/2000)*\exp(-3/400))/80 - (6*\exp(-3/400)*\sin(17/2000))/25, - \\
& (153*\cos(17/1000)*\exp(-3/200))/80 - (6*\exp(-3/200)*\sin(17/1000))/25, -
\end{aligned}$$

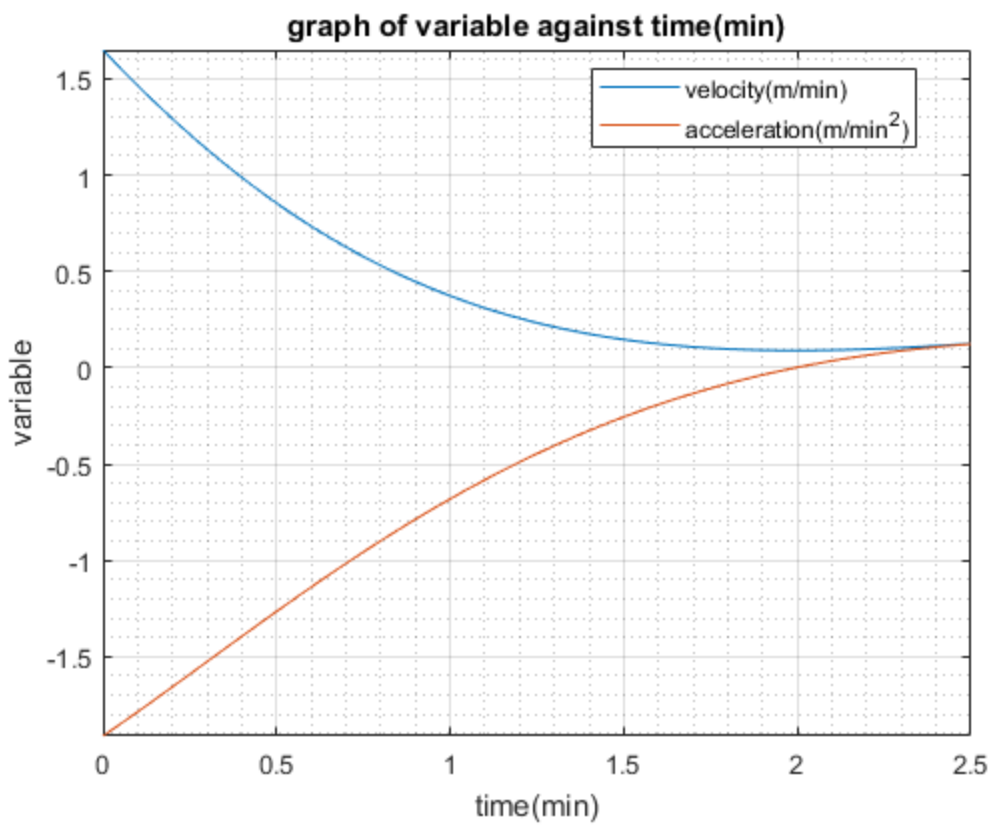
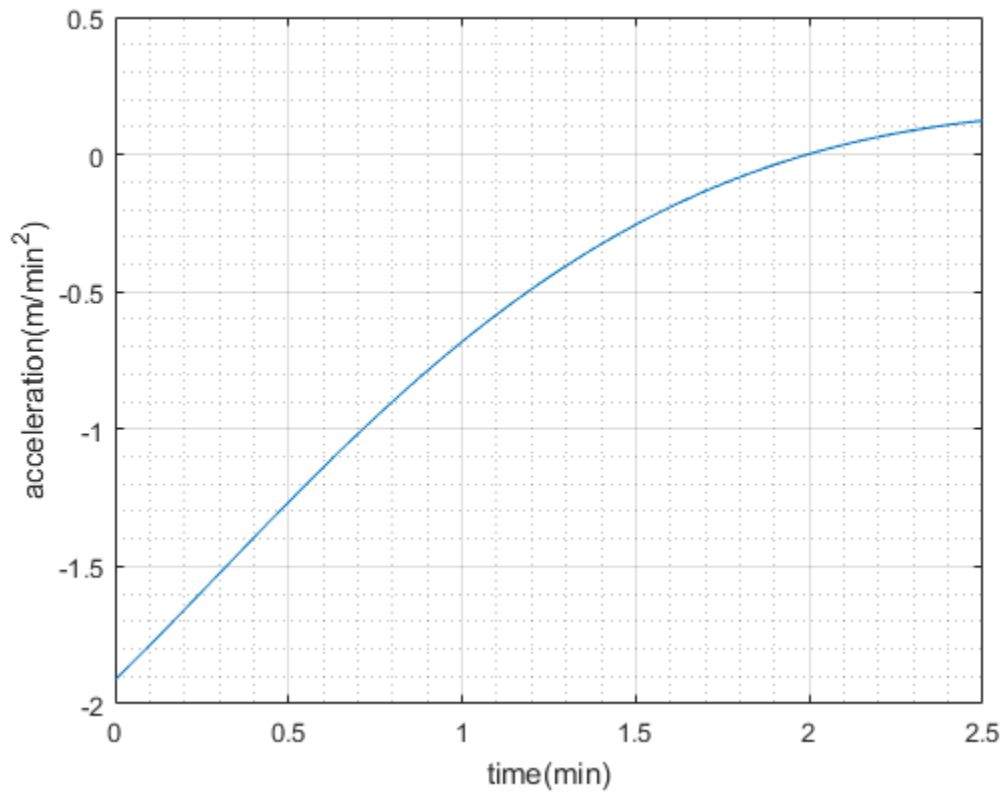
$(153*\cos(51/2000)*\exp(-9/400))/80$ - $(6*\exp(-9/400)*\sin(51/2000))/25,$ -
 $(153*\cos(17/500)*\exp(-3/100))/80$ - $(6*\exp(-3/100)*\sin(17/500))/25,$ -
 $(153*\cos(17/400)*\exp(-3/80))/80$ - $(6*\exp(-3/80)*\sin(17/400))/25,$ -
 $(153*\cos(51/1000)*\exp(-9/200))/80$ - $(6*\exp(-9/200)*\sin(51/1000))/25,$ -
 $(153*\cos(119/2000)*\exp(-21/400))/80$ - $(6*\exp(-21/400)*\sin(119/2000))/25,$ -
 $(153*\cos(17/250)*\exp(-3/50))/80$ - $(6*\exp(-3/50)*\sin(17/250))/25,$ -
 $(153*\cos(153/2000)*\exp(-27/400))/80$ - $(6*\exp(-27/400)*\sin(153/2000))/25,$ -
 $(153*\cos(17/200)*\exp(-3/40))/80$ - $(6*\exp(-3/40)*\sin(17/200))/25,$ -
 $(153*\cos(187/2000)*\exp(-33/400))/80$ - $(6*\exp(-33/400)*\sin(187/2000))/25,$ -
 $(153*\cos(51/500)*\exp(-9/100))/80$ - $(6*\exp(-9/100)*\sin(51/500))/25,$ -
 $(153*\cos(221/2000)*\exp(-39/400))/80$ - $(6*\exp(-39/400)*\sin(221/2000))/25,$ -
 $(153*\cos(119/1000)*\exp(-21/200))/80$ - $(6*\exp(-21/200)*\sin(119/1000))/25,$ -
 $(153*\cos(51/400)*\exp(-9/80))/80$ - $(6*\exp(-9/80)*\sin(51/400))/25,$ -
 $(153*\cos(17/125)*\exp(-3/25))/80$ - $(6*\exp(-3/25)*\sin(17/125))/25,$ -
 $(153*\cos(289/2000)*\exp(-51/400))/80$ - $(6*\exp(-51/400)*\sin(289/2000))/25,$ -
 $(153*\cos(153/1000)*\exp(-27/200))/80$ - $(6*\exp(-27/200)*\sin(153/1000))/25,$ -
 $(153*\cos(323/2000)*\exp(-57/400))/80$ - $(6*\exp(-57/400)*\sin(323/2000))/25,$ -
 $(153*\cos(17/100)*\exp(-3/20))/80$ - $(6*\exp(-3/20)*\sin(17/100))/25,$ -
 $(153*\cos(357/2000)*\exp(-63/400))/80$ - $(6*\exp(-63/400)*\sin(357/2000))/25,$ -
 $(153*\cos(187/1000)*\exp(-33/200))/80$ - $(6*\exp(-33/200)*\sin(187/1000))/25,$ -
 $(153*\cos(391/2000)*\exp(-69/400))/80$ - $(6*\exp(-69/400)*\sin(391/2000))/25,$ -
 $(153*\cos(51/250)*\exp(-9/50))/80$ - $(6*\exp(-9/50)*\sin(51/250))/25,$ - $(153*\cos(17/80)*\exp(-$
 $3/16))/80$ - $(6*\exp(-3/16)*\sin(17/80))/25,$ - $(153*\cos(221/1000)*\exp(-39/200))/80$ -
 $(6*\exp(-39/200)*\sin(221/1000))/25,$ - $(153*\cos(459/2000)*\exp(-81/400))/80$ - $(6*\exp(-$
 $81/400)*\sin(459/2000))/25,$ - $(153*\cos(119/500)*\exp(-21/100))/80$ - $(6*\exp(-$
 $21/100)*\sin(119/500))/25,$ - $(153*\cos(493/2000)*\exp(-87/400))/80$ - $(6*\exp(-$
 $87/400)*\sin(493/2000))/25,$ - $(153*\cos(51/200)*\exp(-9/40))/80$ - $(6*\exp(-$
 $9/40)*\sin(51/200))/25,$ - $(153*\cos(527/2000)*\exp(-93/400))/80$ - $(6*\exp(-$
 $93/400)*\sin(527/2000))/25,$ - $(153*\cos(34/125)*\exp(-6/25))/80$ - $(6*\exp(-$
 $6/25)*\sin(34/125))/25,$ - $(153*\cos(561/2000)*\exp(-99/400))/80$ - $(6*\exp(-$
 $99/400)*\sin(561/2000))/25,$ - $(153*\cos(289/1000)*\exp(-51/200))/80$ - $(6*\exp(-$
 $51/200)*\sin(289/1000))/25,$ - $(153*\cos(119/400)*\exp(-21/80))/80$ - $(6*\exp(-$
 $21/80)*\sin(119/400))/25,$ - $(153*\cos(153/500)*\exp(-27/100))/80$ - $(6*\exp(-$
 $27/100)*\sin(153/500))/25,$ - $(153*\cos(629/2000)*\exp(-111/400))/80$ - $(6*\exp(-$
 $111/400)*\sin(629/2000))/25,$ - $(153*\cos(323/1000)*\exp(-57/200))/80$ - $(6*\exp(-$
 $57/200)*\sin(323/1000))/25,$ - $(153*\cos(663/2000)*\exp(-117/400))/80$ - $(6*\exp(-$
 $117/400)*\sin(663/2000))/25,$ - $(153*\cos(17/50)*\exp(-3/10))/80$ - $(6*\exp(-$
 $3/10)*\sin(17/50))/25,$ - $(153*\cos(697/2000)*\exp(-123/400))/80$ - $(6*\exp(-$
 $123/400)*\sin(697/2000))/25,$ - $(153*\cos(357/1000)*\exp(-63/200))/80$ - $(6*\exp(-$
 $63/200)*\sin(357/1000))/25,$ - $(153*\cos(731/2000)*\exp(-129/400))/80$ - $(6*\exp(-$
 $129/400)*\sin(731/2000))/25,$ - $(153*\cos(187/500)*\exp(-33/100))/80$ - $(6*\exp(-$
 $33/100)*\sin(187/500))/25,$ - $(153*\cos(153/400)*\exp(-27/80))/80$ - $(6*\exp(-$
 $27/80)*\sin(153/400))/25,$ - $(153*\cos(391/1000)*\exp(-69/200))/80$ - $(6*\exp(-$
 $69/200)*\sin(391/1000))/25,$ - $(153*\cos(799/2000)*\exp(-141/400))/80$ - $(6*\exp(-$

$141/400*\sin(799/2000))/25,$	$- (153*\cos(51/125)*\exp(-9/25))/80$	$- (6*\exp(-$
$9/25)*\sin(51/125))/25,$	$(153*\cos(833/2000)*\exp(-147/400))/80$	$6*\exp(-$
$147/400*\sin(833/2000))/25,$	$- (153*\cos(17/40)*\exp(-3/8))/80$	$6*\exp(-$
$3/8)*\sin(17/40))/25,$	$(153*\cos(867/2000)*\exp(-153/400))/80$	$6*\exp(-$
$153/400*\sin(867/2000))/25,$	$- (153*\cos(221/500)*\exp(-39/100))/80$	$6*\exp(-$
$39/100)*\sin(221/500))/25,$	$(153*\cos(901/2000)*\exp(-159/400))/80$	$6*\exp(-$
$159/400*\sin(901/2000))/25,$	$- (153*\cos(459/1000)*\exp(-81/200))/80$	$6*\exp(-$
$81/200)*\sin(459/1000))/25,$	$(153*\cos(187/400)*\exp(-33/80))/80$	$6*\exp(-$
$33/80)*\sin(187/400))/25,$	$- (153*\cos(119/250)*\exp(-21/50))/80$	$6*\exp(-$
$21/50)*\sin(119/250))/25,$	$(153*\cos(969/2000)*\exp(-171/400))/80$	$6*\exp(-$
$171/400)*\sin(969/2000))/25,$	$- (153*\cos(493/1000)*\exp(-87/200))/80$	$6*\exp(-$
$87/200)*\sin(493/1000))/25,$	$(153*\cos(1003/2000)*\exp(-177/400))/80$	$6*\exp(-$
$177/400)*\sin(1003/2000))/25,$	$- (153*\cos(51/100)*\exp(-9/20))/80$	$6*\exp(-$
$9/20)*\sin(51/100))/25,$	$(153*\cos(1037/2000)*\exp(-183/400))/80$	$6*\exp(-$
$183/400)*\sin(1037/2000))/25,$	$- (153*\cos(527/1000)*\exp(-93/200))/80$	$6*\exp(-$
$93/200)*\sin(527/1000))/25,$	$(153*\cos(1071/2000)*\exp(-189/400))/80$	$6*\exp(-$
$189/400)*\sin(1071/2000))/25,$	$- (153*\cos(68/125)*\exp(-12/25))/80$	$6*\exp(-$
$12/25)*\sin(68/125))/25,$	$(153*\cos(221/400)*\exp(-39/80))/80$	$6*\exp(-$
$39/80)*\sin(221/400))/25,$	$- (153*\cos(561/1000)*\exp(-99/200))/80$	$6*\exp(-$
$99/200)*\sin(561/1000))/25,$	$(153*\cos(1139/2000)*\exp(-201/400))/80$	$6*\exp(-$
$201/400)*\sin(1139/2000))/25,$	$- (153*\cos(289/500)*\exp(-51/100))/80$	$6*\exp(-$
$51/100)*\sin(289/500))/25,$	$(153*\cos(1173/2000)*\exp(-207/400))/80$	$6*\exp(-$
$207/400)*\sin(1173/2000))/25,$	$- (153*\cos(119/200)*\exp(-21/40))/80$	$6*\exp(-$
$21/40)*\sin(119/200))/25,$	$(153*\cos(1207/2000)*\exp(-213/400))/80$	$6*\exp(-$
$213/400)*\sin(1207/2000))/25,$	$- (153*\cos(153/250)*\exp(-27/50))/80$	$6*\exp(-$
$27/50)*\sin(153/250))/25,$	$(153*\cos(1241/2000)*\exp(-219/400))/80$	$6*\exp(-$
$219/400)*\sin(1241/2000))/25,$	$- (153*\cos(629/1000)*\exp(-111/200))/80$	$6*\exp(-$
$111/200)*\sin(629/1000))/25,$	$(153*\cos(51/80)*\exp(-9/16))/80$	$6*\exp(-$
$9/16)*\sin(51/80))/25,$	$- (153*\cos(323/500)*\exp(-57/100))/80$	$6*\exp(-$
$57/100)*\sin(323/500))/25,$	$(153*\cos(1309/2000)*\exp(-231/400))/80$	$6*\exp(-$
$231/400)*\sin(1309/2000))/25,$	$- (153*\cos(663/1000)*\exp(-117/200))/80$	$6*\exp(-$
$117/200)*\sin(663/1000))/25,$	$(153*\cos(1343/2000)*\exp(-237/400))/80$	$6*\exp(-$
$237/400)*\sin(1343/2000))/25,$	$- (153*\cos(17/25)*\exp(-3/5))/80$	$6*\exp(-$
$3/5)*\sin(17/25))/25,$	$(153*\cos(1377/2000)*\exp(-243/400))/80$	$6*\exp(-$
$243/400)*\sin(1377/2000))/25,$	$- (153*\cos(697/1000)*\exp(-123/200))/80$	$6*\exp(-$
$123/200)*\sin(697/1000))/25,$	$(153*\cos(1411/2000)*\exp(-249/400))/80$	$6*\exp(-$
$249/400)*\sin(1411/2000))/25,$	$- (153*\cos(357/500)*\exp(-63/100))/80$	$6*\exp(-$
$63/100)*\sin(357/500))/25,$	$(153*\cos(289/400)*\exp(-51/80))/80$	$6*\exp(-$
$51/80)*\sin(289/400))/25,$	$- (153*\cos(731/1000)*\exp(-129/200))/80$	$6*\exp(-$
$129/200)*\sin(731/1000))/25,$	$(153*\cos(1479/2000)*\exp(-261/400))/80$	$6*\exp(-$
$261/400)*\sin(1479/2000))/25,$	$- (153*\cos(187/250)*\exp(-33/50))/80$	$6*\exp(-$
$33/50)*\sin(187/250))/25,$	$(153*\cos(1513/2000)*\exp(-267/400))/80$	$6*\exp(-$
$267/400)*\sin(1513/2000))/25,$	$- (153*\cos(153/200)*\exp(-27/40))/80$	$6*\exp(-$
$27/40)*\sin(153/200))/25,$	$(153*\cos(1547/2000)*\exp(-273/400))/80$	$6*\exp(-$

$273/400 * \sin(1547/2000) / 25$, - $(153 * \cos(391/500) * \exp(-69/100)) / 80$ - $(6 * \exp(-69/100) * \sin(391/500)) / 25$, - $(153 * \cos(1581/2000) * \exp(-279/400)) / 80$ - $(6 * \exp(-279/400) * \sin(1581/2000)) / 25$, - $(153 * \cos(799/1000) * \exp(-141/200)) / 80$ - $(6 * \exp(-141/200) * \sin(799/1000)) / 25$, - $(153 * \cos(323/400) * \exp(-57/80)) / 80$ - $(6 * \exp(-57/80) * \sin(323/400)) / 25$, - $(153 * \cos(102/125) * \exp(-18/25)) / 80$ - $(6 * \exp(-18/25) * \sin(102/125)) / 25$, - $(153 * \cos(1649/2000) * \exp(-291/400)) / 80$ - $(6 * \exp(-291/400) * \sin(1649/2000)) / 25$, - $(153 * \cos(833/1000) * \exp(-147/200)) / 80$ - $(6 * \exp(-147/200) * \sin(833/1000)) / 25$, - $(153 * \cos(1683/2000) * \exp(-297/400)) / 80$ - $(6 * \exp(-297/400) * \sin(1683/2000)) / 25$, - $(153 * \cos(17/20) * \exp(-3/4)) / 80$ - $(6 * \exp(-3/4) * \sin(17/20)) / 25$, - $(153 * \cos(1717/2000) * \exp(-303/400)) / 80$ - $(6 * \exp(-303/400) * \sin(1717/2000)) / 25$, - $(153 * \cos(867/1000) * \exp(-153/200)) / 80$ - $(6 * \exp(-153/200) * \sin(867/1000)) / 25$, - $(153 * \cos(1751/2000) * \exp(-309/400)) / 80$ - $(6 * \exp(-309/400) * \sin(1751/2000)) / 25$, - $(153 * \cos(221/250) * \exp(-39/50)) / 80$ - $(6 * \exp(-39/50) * \sin(221/250)) / 25$, - $(153 * \cos(357/400) * \exp(-63/80)) / 80$ - $(6 * \exp(-63/80) * \sin(357/400)) / 25$, - $(153 * \cos(901/1000) * \exp(-159/200)) / 80$ - $(6 * \exp(-159/200) * \sin(901/1000)) / 25$, - $(153 * \cos(1819/2000) * \exp(-321/400)) / 80$ - $(6 * \exp(-321/400) * \sin(1819/2000)) / 25$, - $(153 * \cos(459/500) * \exp(-81/100)) / 80$ - $(6 * \exp(-81/100) * \sin(459/500)) / 25$, - $(153 * \cos(1853/2000) * \exp(-327/400)) / 80$ - $(6 * \exp(-327/400) * \sin(1853/2000)) / 25$, - $(153 * \cos(187/200) * \exp(-33/40)) / 80$ - $(6 * \exp(-33/40) * \sin(187/200)) / 25$, - $(153 * \cos(1887/2000) * \exp(-333/400)) / 80$ - $(6 * \exp(-333/400) * \sin(1887/2000)) / 25$, - $(153 * \cos(119/125) * \exp(-21/25)) / 80$ - $(6 * \exp(-21/25) * \sin(119/125)) / 25$, - $(153 * \cos(1921/2000) * \exp(-339/400)) / 80$ - $(6 * \exp(-339/400) * \sin(1921/2000)) / 25$, - $(153 * \cos(969/1000) * \exp(-171/200)) / 80$ - $(6 * \exp(-171/200) * \sin(969/1000)) / 25$, - $(153 * \cos(391/400) * \exp(-69/80)) / 80$ - $(6 * \exp(-69/80) * \sin(391/400)) / 25$, - $(153 * \cos(493/500) * \exp(-87/100)) / 80$ - $(6 * \exp(-87/100) * \sin(493/500)) / 25$, - $(153 * \cos(1989/2000) * \exp(-351/400)) / 80$ - $(6 * \exp(-351/400) * \sin(1989/2000)) / 25$, - $(153 * \cos(1003/1000) * \exp(-177/200)) / 80$ - $(6 * \exp(-177/200) * \sin(1003/1000)) / 25$, - $(153 * \cos(2023/2000) * \exp(-357/400)) / 80$ - $(6 * \exp(-357/400) * \sin(2023/2000)) / 25$, - $(153 * \cos(51/50) * \exp(-9/10)) / 80$ - $(6 * \exp(-9/10) * \sin(51/50)) / 25$, - $(153 * \cos(2057/2000) * \exp(-363/400)) / 80$ - $(6 * \exp(-363/400) * \sin(2057/2000)) / 25$, - $(153 * \cos(1037/1000) * \exp(-183/200)) / 80$ - $(6 * \exp(-183/200) * \sin(1037/1000)) / 25$, - $(153 * \cos(2091/2000) * \exp(-369/400)) / 80$ - $(6 * \exp(-369/400) * \sin(2091/2000)) / 25$, - $(153 * \cos(527/500) * \exp(-93/100)) / 80$ - $(6 * \exp(-93/100) * \sin(527/500)) / 25$, - $(153 * \cos(17/16) * \exp(-15/16)) / 80$ - $(6 * \exp(-15/16) * \sin(17/16)) / 25$, - $(153 * \cos(1071/1000) * \exp(-189/200)) / 80$ - $(6 * \exp(-189/200) * \sin(1071/1000)) / 25$, - $(153 * \cos(2159/2000) * \exp(-381/400)) / 80$ - $(6 * \exp(-381/400) * \sin(2159/2000)) / 25$, - $(153 * \cos(136/125) * \exp(-24/25)) / 80$ - $(6 * \exp(-24/25) * \sin(136/125)) / 25$, - $(153 * \cos(2193/2000) * \exp(-387/400)) / 80$ - $(6 * \exp(-387/400) * \sin(2193/2000)) / 25$, - $(153 * \cos(221/200) * \exp(-39/40)) / 80$ - $(6 * \exp(-39/40) * \sin(221/200)) / 25$, - $(153 * \cos(2227/2000) * \exp(-393/400)) / 80$ - $(6 * \exp(-393/400) * \sin(2227/2000)) / 25$, - $(153 * \cos(561/500) * \exp(-99/100)) / 80$ - $(6 * \exp(-99/100) * \sin(561/500)) / 25$, - $(153 * \cos(2261/2000) * \exp(-399/400)) / 80$ - $(6 * \exp(-399/400) * \sin(2261/2000)) / 25$, - $(153 * \cos(1139/1000) * \exp(-201/200)) / 80$ - $(6 * \exp(-201/200) * \sin(1139/1000)) / 25$, - $(153 * \cos(459/400) * \exp(-81/80)) / 80$ - $(6 * \exp(-81/80) * \sin(459/400)) / 25$,

$669/400*\sin(3791/2000))/25,$ - $(153*\cos(238/125)*\exp(-42/25))/80$ - $(6*\exp(-$
 $42/25)*\sin(238/125))/25,$ - $(153*\cos(153/80)*\exp(-27/16))/80$ - $(6*\exp(-$
 $27/16)*\sin(153/80))/25,$ - $(153*\cos(1921/1000)*\exp(-339/200))/80$ - $(6*\exp(-$
 $339/200)*\sin(1921/1000))/25,$ - $(153*\cos(3859/2000)*\exp(-681/400))/80$ - $(6*\exp(-$
 $681/400)*\sin(3859/2000))/25,$ - $(153*\cos(969/500)*\exp(-171/100))/80$ - $(6*\exp(-$
 $171/100)*\sin(969/500))/25,$ - $(153*\cos(3893/2000)*\exp(-687/400))/80$ - $(6*\exp(-$
 $687/400)*\sin(3893/2000))/25,$ - $(153*\cos(391/200)*\exp(-69/40))/80$ - $(6*\exp(-$
 $69/40)*\sin(391/200))/25,$ - $(153*\cos(3927/2000)*\exp(-693/400))/80$ - $(6*\exp(-$
 $693/400)*\sin(3927/2000))/25,$ - $(153*\cos(493/250)*\exp(-87/50))/80$ - $(6*\exp(-$
 $87/50)*\sin(493/250))/25,$ - $(153*\cos(3961/2000)*\exp(-699/400))/80$ - $(6*\exp(-$
 $699/400)*\sin(3961/2000))/25,$ - $(153*\cos(1989/1000)*\exp(-351/200))/80$ - $(6*\exp(-$
 $351/200)*\sin(1989/1000))/25,$ - $(153*\cos(799/400)*\exp(-141/80))/80$ - $(6*\exp(-$
 $141/80)*\sin(799/400))/25,$ - $(153*\cos(1003/500)*\exp(-177/100))/80$ - $(6*\exp(-$
 $177/100)*\sin(1003/500))/25,$ - $(153*\cos(4029/2000)*\exp(-711/400))/80$ - $(6*\exp(-$
 $711/400)*\sin(4029/2000))/25,$ - $(153*\cos(2023/1000)*\exp(-357/200))/80$ - $(6*\exp(-$
 $357/200)*\sin(2023/1000))/25,$ - $(153*\cos(4063/2000)*\exp(-717/400))/80$ - $(6*\exp(-$
 $717/400)*\sin(4063/2000))/25,$ - $(153*\cos(51/25)*\exp(-9/5))/80$ - $(6*\exp(-$
 $9/5)*\sin(51/25))/25,$ - $(153*\cos(4097/2000)*\exp(-723/400))/80$ - $(6*\exp(-$
 $723/400)*\sin(4097/2000))/25,$ - $(153*\cos(2057/1000)*\exp(-363/200))/80$ - $(6*\exp(-$
 $363/200)*\sin(2057/1000))/25,$ - $(153*\cos(4131/2000)*\exp(-729/400))/80$ - $(6*\exp(-$
 $729/400)*\sin(4131/2000))/25,$ - $(153*\cos(1037/500)*\exp(-183/100))/80$ - $(6*\exp(-$
 $183/100)*\sin(1037/500))/25,$ - $(153*\cos(833/400)*\exp(-147/80))/80$ - $(6*\exp(-$
 $147/80)*\sin(833/400))/25,$ - $(153*\cos(2091/1000)*\exp(-369/200))/80$ - $(6*\exp(-$
 $369/200)*\sin(2091/1000))/25,$ - $(153*\cos(4199/2000)*\exp(-741/400))/80$ - $(6*\exp(-$
 $741/400)*\sin(4199/2000))/25,$ - $(153*\cos(527/250)*\exp(-93/50))/80$ - $(6*\exp(-$
 $93/50)*\sin(527/250))/25,$ - $(153*\cos(4233/2000)*\exp(-747/400))/80$ - $(6*\exp(-$
 $747/400)*\sin(4233/2000))/25,$ - $(153*\cos(17/8)*\exp(-15/8))/80$ - $(6*\exp(-$
 $15/8)*\sin(17/8))/25]$





c) commandwindow

```
clear  
clc  
syms x  
y=5*sin(5*x)^5  
Y=y^2  
ZY=int(Y)*pi  
dint=int(ZY,0,pi)  
zm=double(dint)  
format long g
```

OUTPUT

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

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

$$ZY = \pi \left(\frac{1575x}{256} - \frac{525 \sin(10x)}{512} + \frac{75 \sin(20x)}{256} - \frac{75 \sin(30x)}{1024} + \frac{25 \sin(40x)}{2048} - \frac{\sin(50x)}{1024} \right)$$

$$dint = \frac{1575\pi^3}{512}$$

$$zm = 95.381$$