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MATRIC NO: 16/ENG02/032

DEPARTMENT: COMPUTER ENGINEERING

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(A)

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

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

```
B=[-4; 2; 6; 4]
B =
```

```
   -4
     2
     6
     4
```

```
C= inv(A)
C =
```

```

-0.1786  -0.1020  0.5714  0.0153
 0.0357  -0.0153  0.0357  -0.0102
 0.1429   0.1173  0.3929  -0.0051
-0.0357   0.1582  0.9643  -0.0612

```

```

D= C*B
D =

```

```

 4.0000
-0.0000
 2.0000
 6.0000

```

(B)

```

commandwindow
clear
clc
close all
syms t
d= 1.5* exp(-0.75* t) * sin(0.85*t) + 0.375*t

```

```

d =

```

```

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

```

```

tn= [0:0.01:2.5]
tn =

```

```

Columns 1 through 8

```

```

      0    0.0100    0.0200    0.0300    0.0400    0.0500    0.0600
0.0700

```

```

Columns 9 through 16

```

```

      0.0800    0.0900    0.1000    0.1100    0.1200    0.1300    0.1400
0.1500

```

Columns 17 through 24

0.1600	0.1700	0.1800	0.1900	0.2000	0.2100	0.2200
0.2300						

Columns 25 through 32

0.2400	0.2500	0.2600	0.2700	0.2800	0.2900	0.3000
0.3100						

Columns 33 through 40

0.3200	0.3300	0.3400	0.3500	0.3600	0.3700	0.3800
0.3900						

Columns 41 through 48

0.4000	0.4100	0.4200	0.4300	0.4400	0.4500	0.4600
0.4700						

Columns 49 through 56

0.4800	0.4900	0.5000	0.5100	0.5200	0.5300	0.5400
0.5500						

Columns 57 through 64

0.5600	0.5700	0.5800	0.5900	0.6000	0.6100	0.6200
0.6300						

Columns 65 through 72

0.6400	0.6500	0.6600	0.6700	0.6800	0.6900	0.7000
0.7100						

Columns 73 through 80

0.7200	0.7300	0.7400	0.7500	0.7600	0.7700	0.7800
0.7900						

Columns 81 through 88

0.8000	0.8100	0.8200	0.8300	0.8400	0.8500	0.8600
0.8700						

Columns 89 through 96

0.8800	0.8900	0.9000	0.9100	0.9200	0.9300	0.9400
0.9500						

Columns 97 through 104

0.9600	0.9700	0.9800	0.9900	1.0000	1.0100	1.0200
1.0300						

Columns 105 through 112

1.0400	1.0500	1.0600	1.0700	1.0800	1.0900	1.1000
1.1100						

Columns 113 through 120

1.1200	1.1300	1.1400	1.1500	1.1600	1.1700	1.1800
1.1900						

Columns 121 through 128

1.2000	1.2100	1.2200	1.2300	1.2400	1.2500	1.2600
1.2700						

Columns 129 through 136

1.2800	1.2900	1.3000	1.3100	1.3200	1.3300	1.3400
1.3500						

Columns 137 through 144

1.3600	1.3700	1.3800	1.3900	1.4000	1.4100	1.4200
1.4300						

Columns 145 through 152

1.4400	1.4500	1.4600	1.4700	1.4800	1.4900	1.5000
1.5100						

Columns 153 through 160

1.5200	1.5300	1.5400	1.5500	1.5600	1.5700	1.5800
1.5900						

Columns 161 through 168

1.6000	1.6100	1.6200	1.6300	1.6400	1.6500	1.6600
1.6700						

Columns 169 through 176

1.6800	1.6900	1.7000	1.7100	1.7200	1.7300	1.7400
1.7500						

Columns 177 through 184

1.7600	1.7700	1.7800	1.7900	1.8000	1.8100	1.8200
1.8300						

Columns 185 through 192

1.8400	1.8500	1.8600	1.8700	1.8800	1.8900	1.9000
1.9100						

Columns 193 through 200

1.9200	1.9300	1.9400	1.9500	1.9600	1.9700	1.9800
1.9900						

Columns 201 through 208

2.0000	2.0100	2.0200	2.0300	2.0400	2.0500	2.0600
2.0700						

Columns 209 through 216

2.0800	2.0900	2.1000	2.1100	2.1200	2.1300	2.1400
2.1500						

Columns 217 through 224

2.1600	2.1700	2.1800	2.1900	2.2000	2.2100	2.2200
2.2300						

Columns 225 through 232

2.2400	2.2500	2.2600	2.2700	2.2800	2.2900	2.3000
2.3100						

Columns 233 through 240

2.3200	2.3300	2.3400	2.3500	2.3600	2.3700	2.3800
2.3900						

Columns 241 through 248

2.4000 2.4100 2.4200 2.4300 2.4400 2.4500 2.4600
2.4700

Columns 249 through 251

2.4800 2.4900 2.5000

v=diff(d)
v =

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

vn= subs(v,tn)
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,

$(51 \cdot \cos(51/200) \cdot \exp(-9/40))/40 - (9 \cdot \exp(-9/40) \cdot \sin(51/200))/8 + 3/8,$
 $(51 \cdot \cos(527/2000) \cdot \exp(-93/400))/40 - (9 \cdot \exp(-93/400) \cdot \sin(527/2000))/8 + 3/8,$
 $(51 \cdot \cos(34/125) \cdot \exp(-6/25))/40 - (9 \cdot \exp(-6/25) \cdot \sin(34/125))/8 + 3/8,$
 $(51 \cdot \cos(561/2000) \cdot \exp(-99/400))/40 - (9 \cdot \exp(-99/400) \cdot \sin(561/2000))/8 + 3/8,$
 $(51 \cdot \cos(289/1000) \cdot \exp(-51/200))/40 - (9 \cdot \exp(-51/200) \cdot \sin(289/1000))/8 + 3/8,$
 $(51 \cdot \cos(119/400) \cdot \exp(-21/80))/40 - (9 \cdot \exp(-21/80) \cdot \sin(119/400))/8 + 3/8,$
 $(51 \cdot \cos(153/500) \cdot \exp(-27/100))/40 - (9 \cdot \exp(-27/100) \cdot \sin(153/500))/8 + 3/8,$
 $(51 \cdot \cos(629/2000) \cdot \exp(-111/400))/40 - (9 \cdot \exp(-111/400) \cdot \sin(629/2000))/8 +$
 $3/8, (51 \cdot \cos(323/1000) \cdot \exp(-57/200))/40 - (9 \cdot \exp(-57/200) \cdot \sin(323/1000))/8 +$
 $3/8, (51 \cdot \cos(663/2000) \cdot \exp(-117/400))/40 - (9 \cdot \exp(-117/400) \cdot \sin(663/2000))/8$
 $+ 3/8, (51 \cdot \cos(17/50) \cdot \exp(-3/10))/40 - (9 \cdot \exp(-3/10) \cdot \sin(17/50))/8 + 3/8,$
 $(51 \cdot \cos(697/2000) \cdot \exp(-123/400))/40 - (9 \cdot \exp(-123/400) \cdot \sin(697/2000))/8 +$
 $3/8, (51 \cdot \cos(357/1000) \cdot \exp(-63/200))/40 - (9 \cdot \exp(-63/200) \cdot \sin(357/1000))/8 +$
 $3/8, (51 \cdot \cos(731/2000) \cdot \exp(-129/400))/40 - (9 \cdot \exp(-129/400) \cdot \sin(731/2000))/8$
 $+ 3/8, (51 \cdot \cos(187/500) \cdot \exp(-33/100))/40 - (9 \cdot \exp(-33/100) \cdot \sin(187/500))/8 +$
 $3/8, (51 \cdot \cos(153/400) \cdot \exp(-27/80))/40 - (9 \cdot \exp(-27/80) \cdot \sin(153/400))/8 + 3/8,$
 $(51 \cdot \cos(391/1000) \cdot \exp(-69/200))/40 - (9 \cdot \exp(-69/200) \cdot \sin(391/1000))/8 + 3/8,$
 $(51 \cdot \cos(799/2000) \cdot \exp(-141/400))/40 - (9 \cdot \exp(-141/400) \cdot \sin(799/2000))/8 +$
 $3/8, (51 \cdot \cos(51/125) \cdot \exp(-9/25))/40 - (9 \cdot \exp(-9/25) \cdot \sin(51/125))/8 + 3/8,$
 $(51 \cdot \cos(833/2000) \cdot \exp(-147/400))/40 - (9 \cdot \exp(-147/400) \cdot \sin(833/2000))/8 +$
 $3/8, (51 \cdot \cos(17/40) \cdot \exp(-3/8))/40 - (9 \cdot \exp(-3/8) \cdot \sin(17/40))/8 + 3/8,$
 $(51 \cdot \cos(867/2000) \cdot \exp(-153/400))/40 - (9 \cdot \exp(-153/400) \cdot \sin(867/2000))/8 +$
 $3/8, (51 \cdot \cos(221/500) \cdot \exp(-39/100))/40 - (9 \cdot \exp(-39/100) \cdot \sin(221/500))/8 +$
 $3/8, (51 \cdot \cos(901/2000) \cdot \exp(-159/400))/40 - (9 \cdot \exp(-159/400) \cdot \sin(901/2000))/8$
 $+ 3/8, (51 \cdot \cos(459/1000) \cdot \exp(-81/200))/40 - (9 \cdot \exp(-81/200) \cdot \sin(459/1000))/8$
 $+ 3/8, (51 \cdot \cos(187/400) \cdot \exp(-33/80))/40 - (9 \cdot \exp(-33/80) \cdot \sin(187/400))/8 +$
 $3/8, (51 \cdot \cos(119/250) \cdot \exp(-21/50))/40 - (9 \cdot \exp(-21/50) \cdot \sin(119/250))/8 + 3/8,$
 $(51 \cdot \cos(969/2000) \cdot \exp(-171/400))/40 - (9 \cdot \exp(-171/400) \cdot \sin(969/2000))/8 +$
 $3/8, (51 \cdot \cos(493/1000) \cdot \exp(-87/200))/40 - (9 \cdot \exp(-87/200) \cdot \sin(493/1000))/8 +$
 $3/8, (51 \cdot \cos(1003/2000) \cdot \exp(-177/400))/40 - (9 \cdot \exp(-$
 $177/400) \cdot \sin(1003/2000))/8 + 3/8, (51 \cdot \cos(51/100) \cdot \exp(-9/20))/40 - (9 \cdot \exp(-$
 $9/20) \cdot \sin(51/100))/8 + 3/8, (51 \cdot \cos(1037/2000) \cdot \exp(-183/400))/40 - (9 \cdot \exp(-$
 $183/400) \cdot \sin(1037/2000))/8 + 3/8, (51 \cdot \cos(527/1000) \cdot \exp(-93/200))/40 -$
 $(9 \cdot \exp(-93/200) \cdot \sin(527/1000))/8 + 3/8, (51 \cdot \cos(1071/2000) \cdot \exp(-189/400))/40$
 $- (9 \cdot \exp(-189/400) \cdot \sin(1071/2000))/8 + 3/8, (51 \cdot \cos(68/125) \cdot \exp(-12/25))/40 -$
 $(9 \cdot \exp(-12/25) \cdot \sin(68/125))/8 + 3/8, (51 \cdot \cos(221/400) \cdot \exp(-39/80))/40 -$
 $(9 \cdot \exp(-39/80) \cdot \sin(221/400))/8 + 3/8, (51 \cdot \cos(561/1000) \cdot \exp(-99/200))/40 -$
 $(9 \cdot \exp(-99/200) \cdot \sin(561/1000))/8 + 3/8, (51 \cdot \cos(1139/2000) \cdot \exp(-201/400))/40$
 $- (9 \cdot \exp(-201/400) \cdot \sin(1139/2000))/8 + 3/8, (51 \cdot \cos(289/500) \cdot \exp(-51/100))/40$
 $- (9 \cdot \exp(-51/100) \cdot \sin(289/500))/8 + 3/8, (51 \cdot \cos(1173/2000) \cdot \exp(-207/400))/40$
 $- (9 \cdot \exp(-207/400) \cdot \sin(1173/2000))/8 + 3/8, (51 \cdot \cos(119/200) \cdot \exp(-21/40))/40$
 $- (9 \cdot \exp(-21/40) \cdot \sin(119/200))/8 + 3/8, (51 \cdot \cos(1207/2000) \cdot \exp(-213/400))/40$
 $- (9 \cdot \exp(-213/400) \cdot \sin(1207/2000))/8 + 3/8, (51 \cdot \cos(153/250) \cdot \exp(-27/50))/40$
 $- (9 \cdot \exp(-27/50) \cdot \sin(153/250))/8 + 3/8, (51 \cdot \cos(1241/2000) \cdot \exp(-219/400))/40$
 $- (9 \cdot \exp(-219/400) \cdot \sin(1241/2000))/8 + 3/8, (51 \cdot \cos(629/1000) \cdot \exp(-$
 $111/200))/40 - (9 \cdot \exp(-111/200) \cdot \sin(629/1000))/8 + 3/8, (51 \cdot \cos(51/80) \cdot \exp(-$
 $9/16))/40 - (9 \cdot \exp(-9/16) \cdot \sin(51/80))/8 + 3/8, (51 \cdot \cos(323/500) \cdot \exp(-$
 $57/100))/40 - (9 \cdot \exp(-57/100) \cdot \sin(323/500))/8 + 3/8, (51 \cdot \cos(1309/2000) \cdot \exp(-$
 $231/400))/40 - (9 \cdot \exp(-231/400) \cdot \sin(1309/2000))/8 + 3/8,$
 $(51 \cdot \cos(663/1000) \cdot \exp(-117/200))/40 - (9 \cdot \exp(-117/200) \cdot \sin(663/1000))/8 +$
 $3/8, (51 \cdot \cos(1343/2000) \cdot \exp(-237/400))/40 - (9 \cdot \exp(-$
 $237/400) \cdot \sin(1343/2000))/8 + 3/8, (51 \cdot \cos(17/25) \cdot \exp(-3/5))/40 - (9 \cdot \exp(-$
 $3/5) \cdot \sin(17/25))/8 + 3/8, (51 \cdot \cos(1377/2000) \cdot \exp(-243/400))/40 - (9 \cdot \exp(-$

$243/400) * \sin(1377/2000)) / 8 + 3/8, (51 * \cos(697/1000) * \exp(-123/200)) / 40 -$
 $(9 * \exp(-123/200) * \sin(697/1000)) / 8 + 3/8, (51 * \cos(1411/2000) * \exp(-249/400)) / 40$
 $- (9 * \exp(-249/400) * \sin(1411/2000)) / 8 + 3/8, (51 * \cos(357/500) * \exp(-63/100)) / 40$
 $- (9 * \exp(-63/100) * \sin(357/500)) / 8 + 3/8, (51 * \cos(289/400) * \exp(-51/80)) / 40 -$
 $(9 * \exp(-51/80) * \sin(289/400)) / 8 + 3/8, (51 * \cos(731/1000) * \exp(-129/200)) / 40 -$
 $(9 * \exp(-129/200) * \sin(731/1000)) / 8 + 3/8, (51 * \cos(1479/2000) * \exp(-261/400)) / 40$
 $- (9 * \exp(-261/400) * \sin(1479/2000)) / 8 + 3/8, (51 * \cos(187/250) * \exp(-33/50)) / 40$
 $- (9 * \exp(-33/50) * \sin(187/250)) / 8 + 3/8, (51 * \cos(1513/2000) * \exp(-267/400)) / 40$
 $- (9 * \exp(-267/400) * \sin(1513/2000)) / 8 + 3/8, (51 * \cos(153/200) * \exp(-27/40)) / 40$
 $- (9 * \exp(-27/40) * \sin(153/200)) / 8 + 3/8, (51 * \cos(1547/2000) * \exp(-273/400)) / 40$
 $- (9 * \exp(-273/400) * \sin(1547/2000)) / 8 + 3/8, (51 * \cos(391/500) * \exp(-69/100)) / 40$
 $- (9 * \exp(-69/100) * \sin(391/500)) / 8 + 3/8, (51 * \cos(1581/2000) * \exp(-279/400)) / 40$
 $- (9 * \exp(-279/400) * \sin(1581/2000)) / 8 + 3/8, (51 * \cos(799/1000) * \exp(-$
 $141/200)) / 40 - (9 * \exp(-141/200) * \sin(799/1000)) / 8 + 3/8,$
 $(51 * \cos(323/400) * \exp(-57/80)) / 40 - (9 * \exp(-57/80) * \sin(323/400)) / 8 + 3/8,$
 $(51 * \cos(102/125) * \exp(-18/25)) / 40 - (9 * \exp(-18/25) * \sin(102/125)) / 8 + 3/8,$
 $(51 * \cos(1649/2000) * \exp(-291/400)) / 40 - (9 * \exp(-291/400) * \sin(1649/2000)) / 8 +$
 $3/8, (51 * \cos(833/1000) * \exp(-147/200)) / 40 - (9 * \exp(-147/200) * \sin(833/1000)) / 8$
 $+ 3/8, (51 * \cos(1683/2000) * \exp(-297/400)) / 40 - (9 * \exp(-$
 $297/400) * \sin(1683/2000)) / 8 + 3/8, (51 * \cos(17/20) * \exp(-3/4)) / 40 - (9 * \exp(-$
 $3/4) * \sin(17/20)) / 8 + 3/8, (51 * \cos(1717/2000) * \exp(-303/400)) / 40 - (9 * \exp(-$
 $303/400) * \sin(1717/2000)) / 8 + 3/8, (51 * \cos(867/1000) * \exp(-153/200)) / 40 -$
 $(9 * \exp(-153/200) * \sin(867/1000)) / 8 + 3/8, (51 * \cos(1751/2000) * \exp(-309/400)) / 40$
 $- (9 * \exp(-309/400) * \sin(1751/2000)) / 8 + 3/8, (51 * \cos(221/250) * \exp(-39/50)) / 40$
 $- (9 * \exp(-39/50) * \sin(221/250)) / 8 + 3/8, (51 * \cos(357/400) * \exp(-63/80)) / 40 -$
 $(9 * \exp(-63/80) * \sin(357/400)) / 8 + 3/8, (51 * \cos(901/1000) * \exp(-159/200)) / 40 -$
 $(9 * \exp(-159/200) * \sin(901/1000)) / 8 + 3/8, (51 * \cos(1819/2000) * \exp(-321/400)) / 40$
 $- (9 * \exp(-321/400) * \sin(1819/2000)) / 8 + 3/8, (51 * \cos(459/500) * \exp(-81/100)) / 40$
 $- (9 * \exp(-81/100) * \sin(459/500)) / 8 + 3/8, (51 * \cos(1853/2000) * \exp(-327/400)) / 40$
 $- (9 * \exp(-327/400) * \sin(1853/2000)) / 8 + 3/8, (51 * \cos(187/200) * \exp(-33/40)) / 40$
 $- (9 * \exp(-33/40) * \sin(187/200)) / 8 + 3/8, (51 * \cos(1887/2000) * \exp(-333/400)) / 40$
 $- (9 * \exp(-333/400) * \sin(1887/2000)) / 8 + 3/8, (51 * \cos(119/125) * \exp(-21/25)) / 40$
 $- (9 * \exp(-21/25) * \sin(119/125)) / 8 + 3/8, (51 * \cos(1921/2000) * \exp(-339/400)) / 40$
 $- (9 * \exp(-339/400) * \sin(1921/2000)) / 8 + 3/8, (51 * \cos(969/1000) * \exp(-$
 $171/200)) / 40 - (9 * \exp(-171/200) * \sin(969/1000)) / 8 + 3/8,$
 $(51 * \cos(391/400) * \exp(-69/80)) / 40 - (9 * \exp(-69/80) * \sin(391/400)) / 8 + 3/8,$
 $(51 * \cos(493/500) * \exp(-87/100)) / 40 - (9 * \exp(-87/100) * \sin(493/500)) / 8 + 3/8,$
 $(51 * \cos(1989/2000) * \exp(-351/400)) / 40 - (9 * \exp(-351/400) * \sin(1989/2000)) / 8 +$
 $3/8, (51 * \cos(1003/1000) * \exp(-177/200)) / 40 - (9 * \exp(-$
 $177/200) * \sin(1003/1000)) / 8 + 3/8, (51 * \cos(2023/2000) * \exp(-357/400)) / 40 -$
 $(9 * \exp(-357/400) * \sin(2023/2000)) / 8 + 3/8, (51 * \cos(51/50) * \exp(-9/10)) / 40 -$
 $(9 * \exp(-9/10) * \sin(51/50)) / 8 + 3/8, (51 * \cos(2057/2000) * \exp(-363/400)) / 40 -$
 $(9 * \exp(-363/400) * \sin(2057/2000)) / 8 + 3/8, (51 * \cos(1037/1000) * \exp(-$
 $183/200)) / 40 - (9 * \exp(-183/200) * \sin(1037/1000)) / 8 + 3/8,$
 $(51 * \cos(2091/2000) * \exp(-369/400)) / 40 - (9 * \exp(-369/400) * \sin(2091/2000)) / 8 +$
 $3/8, (51 * \cos(527/500) * \exp(-93/100)) / 40 - (9 * \exp(-93/100) * \sin(527/500)) / 8 +$
 $3/8, (51 * \cos(17/16) * \exp(-15/16)) / 40 - (9 * \exp(-15/16) * \sin(17/16)) / 8 + 3/8,$
 $(51 * \cos(1071/1000) * \exp(-189/200)) / 40 - (9 * \exp(-189/200) * \sin(1071/1000)) / 8 +$
 $3/8, (51 * \cos(2159/2000) * \exp(-381/400)) / 40 - (9 * \exp(-$
 $381/400) * \sin(2159/2000)) / 8 + 3/8, (51 * \cos(136/125) * \exp(-24/25)) / 40 - (9 * \exp(-$
 $24/25) * \sin(136/125)) / 8 + 3/8, (51 * \cos(2193/2000) * \exp(-387/400)) / 40 - (9 * \exp(-$
 $387/400) * \sin(2193/2000)) / 8 + 3/8, (51 * \cos(221/200) * \exp(-39/40)) / 40 - (9 * \exp(-$
 $39/40) * \sin(221/200)) / 8 + 3/8, (51 * \cos(2227/2000) * \exp(-393/400)) / 40 - (9 * \exp(-$

$393/400) * \sin(2227/2000)) / 8 + 3/8, (51 * \cos(561/500) * \exp(-99/100)) / 40 -$
 $(9 * \exp(-99/100) * \sin(561/500)) / 8 + 3/8, (51 * \cos(2261/2000) * \exp(-399/400)) / 40 -$
 $(9 * \exp(-399/400) * \sin(2261/2000)) / 8 + 3/8, (51 * \cos(1139/1000) * \exp(-$
 $201/200)) / 40 - (9 * \exp(-201/200) * \sin(1139/1000)) / 8 + 3/8,$
 $(51 * \cos(459/400) * \exp(-81/80)) / 40 - (9 * \exp(-81/80) * \sin(459/400)) / 8 + 3/8,$
 $(51 * \cos(289/250) * \exp(-51/50)) / 40 - (9 * \exp(-51/50) * \sin(289/250)) / 8 + 3/8,$
 $(51 * \cos(2329/2000) * \exp(-411/400)) / 40 - (9 * \exp(-411/400) * \sin(2329/2000)) / 8 +$
 $3/8, (51 * \cos(1173/1000) * \exp(-207/200)) / 40 - (9 * \exp(-$
 $207/200) * \sin(1173/1000)) / 8 + 3/8, (51 * \cos(2363/2000) * \exp(-417/400)) / 40 -$
 $(9 * \exp(-417/400) * \sin(2363/2000)) / 8 + 3/8, (51 * \cos(119/100) * \exp(-21/20)) / 40 -$
 $(9 * \exp(-21/20) * \sin(119/100)) / 8 + 3/8, (51 * \cos(2397/2000) * \exp(-423/400)) / 40 -$
 $(9 * \exp(-423/400) * \sin(2397/2000)) / 8 + 3/8, (51 * \cos(1207/1000) * \exp(-$
 $213/200)) / 40 - (9 * \exp(-213/200) * \sin(1207/1000)) / 8 + 3/8,$
 $(51 * \cos(2431/2000) * \exp(-429/400)) / 40 - (9 * \exp(-429/400) * \sin(2431/2000)) / 8 +$
 $3/8, (51 * \cos(153/125) * \exp(-27/25)) / 40 - (9 * \exp(-27/25) * \sin(153/125)) / 8 + 3/8,$
 $(51 * \cos(493/400) * \exp(-87/80)) / 40 - (9 * \exp(-87/80) * \sin(493/400)) / 8 + 3/8,$
 $(51 * \cos(1241/1000) * \exp(-219/200)) / 40 - (9 * \exp(-219/200) * \sin(1241/1000)) / 8 +$
 $3/8, (51 * \cos(2499/2000) * \exp(-441/400)) / 40 - (9 * \exp(-$
 $441/400) * \sin(2499/2000)) / 8 + 3/8, (51 * \cos(629/500) * \exp(-111/100)) / 40 -$
 $(9 * \exp(-111/100) * \sin(629/500)) / 8 + 3/8, (51 * \cos(2533/2000) * \exp(-447/400)) / 40$
 $- (9 * \exp(-447/400) * \sin(2533/2000)) / 8 + 3/8, (51 * \cos(51/40) * \exp(-9/8)) / 40 -$
 $(9 * \exp(-9/8) * \sin(51/40)) / 8 + 3/8, (51 * \cos(2567/2000) * \exp(-453/400)) / 40 -$
 $(9 * \exp(-453/400) * \sin(2567/2000)) / 8 + 3/8, (51 * \cos(323/250) * \exp(-57/50)) / 40 -$
 $(9 * \exp(-57/50) * \sin(323/250)) / 8 + 3/8, (51 * \cos(2601/2000) * \exp(-459/400)) / 40 -$
 $(9 * \exp(-459/400) * \sin(2601/2000)) / 8 + 3/8, (51 * \cos(1309/1000) * \exp(-$
 $231/200)) / 40 - (9 * \exp(-231/200) * \sin(1309/1000)) / 8 + 3/8,$
 $(51 * \cos(527/400) * \exp(-93/80)) / 40 - (9 * \exp(-93/80) * \sin(527/400)) / 8 + 3/8,$
 $(51 * \cos(663/500) * \exp(-117/100)) / 40 - (9 * \exp(-117/100) * \sin(663/500)) / 8 + 3/8,$
 $(51 * \cos(2669/2000) * \exp(-471/400)) / 40 - (9 * \exp(-471/400) * \sin(2669/2000)) / 8 +$
 $3/8, (51 * \cos(1343/1000) * \exp(-237/200)) / 40 - (9 * \exp(-$
 $237/200) * \sin(1343/1000)) / 8 + 3/8, (51 * \cos(2703/2000) * \exp(-477/400)) / 40 -$
 $(9 * \exp(-477/400) * \sin(2703/2000)) / 8 + 3/8, (51 * \cos(34/25) * \exp(-6/5)) / 40 -$
 $(9 * \exp(-6/5) * \sin(34/25)) / 8 + 3/8, (51 * \cos(2737/2000) * \exp(-483/400)) / 40 -$
 $(9 * \exp(-483/400) * \sin(2737/2000)) / 8 + 3/8, (51 * \cos(1377/1000) * \exp(-$
 $243/200)) / 40 - (9 * \exp(-243/200) * \sin(1377/1000)) / 8 + 3/8,$
 $(51 * \cos(2771/2000) * \exp(-489/400)) / 40 - (9 * \exp(-489/400) * \sin(2771/2000)) / 8 +$
 $3/8, (51 * \cos(697/500) * \exp(-123/100)) / 40 - (9 * \exp(-123/100) * \sin(697/500)) / 8 +$
 $3/8, (51 * \cos(561/400) * \exp(-99/80)) / 40 - (9 * \exp(-99/80) * \sin(561/400)) / 8 + 3/8,$
 $(51 * \cos(1411/1000) * \exp(-249/200)) / 40 - (9 * \exp(-249/200) * \sin(1411/1000)) / 8 +$
 $3/8, (51 * \cos(2839/2000) * \exp(-501/400)) / 40 - (9 * \exp(-$
 $501/400) * \sin(2839/2000)) / 8 + 3/8, (51 * \cos(357/250) * \exp(-63/50)) / 40 - (9 * \exp(-$
 $63/50) * \sin(357/250)) / 8 + 3/8, (51 * \cos(2873/2000) * \exp(-507/400)) / 40 - (9 * \exp(-$
 $507/400) * \sin(2873/2000)) / 8 + 3/8, (51 * \cos(289/200) * \exp(-51/40)) / 40 - (9 * \exp(-$
 $51/40) * \sin(289/200)) / 8 + 3/8, (51 * \cos(2907/2000) * \exp(-513/400)) / 40 - (9 * \exp(-$
 $513/400) * \sin(2907/2000)) / 8 + 3/8, (51 * \cos(731/500) * \exp(-129/100)) / 40 -$
 $(9 * \exp(-129/100) * \sin(731/500)) / 8 + 3/8, (51 * \cos(2941/2000) * \exp(-519/400)) / 40$
 $- (9 * \exp(-519/400) * \sin(2941/2000)) / 8 + 3/8, (51 * \cos(1479/1000) * \exp(-$
 $261/200)) / 40 - (9 * \exp(-261/200) * \sin(1479/1000)) / 8 + 3/8,$
 $(51 * \cos(119/80) * \exp(-21/16)) / 40 - (9 * \exp(-21/16) * \sin(119/80)) / 8 + 3/8,$
 $(51 * \cos(187/125) * \exp(-33/25)) / 40 - (9 * \exp(-33/25) * \sin(187/125)) / 8 + 3/8,$
 $(51 * \cos(3009/2000) * \exp(-531/400)) / 40 - (9 * \exp(-531/400) * \sin(3009/2000)) / 8 +$
 $3/8, (51 * \cos(1513/1000) * \exp(-267/200)) / 40 - (9 * \exp(-$
 $267/200) * \sin(1513/1000)) / 8 + 3/8, (51 * \cos(3043/2000) * \exp(-537/400)) / 40 -$

$(9*\exp(-537/400)*\sin(3043/2000))/8 + 3/8, (51*\cos(153/100)*\exp(-27/20))/40 -$
 $(9*\exp(-27/20)*\sin(153/100))/8 + 3/8, (51*\cos(3077/2000)*\exp(-543/400))/40 -$
 $(9*\exp(-543/400)*\sin(3077/2000))/8 + 3/8, (51*\cos(1547/1000)*\exp(-$
 $273/200))/40 - (9*\exp(-273/200)*\sin(1547/1000))/8 + 3/8,$
 $(51*\cos(3111/2000)*\exp(-549/400))/40 - (9*\exp(-549/400)*\sin(3111/2000))/8 +$
 $3/8, (51*\cos(391/250)*\exp(-69/50))/40 - (9*\exp(-69/50)*\sin(391/250))/8 + 3/8,$
 $(51*\cos(629/400)*\exp(-111/80))/40 - (9*\exp(-111/80)*\sin(629/400))/8 + 3/8,$
 $(51*\cos(1581/1000)*\exp(-279/200))/40 - (9*\exp(-279/200)*\sin(1581/1000))/8 +$
 $3/8, (51*\cos(3179/2000)*\exp(-561/400))/40 - (9*\exp(-$
 $561/400)*\sin(3179/2000))/8 + 3/8, (51*\cos(799/500)*\exp(-141/100))/40 -$
 $(9*\exp(-141/100)*\sin(799/500))/8 + 3/8, (51*\cos(3213/2000)*\exp(-567/400))/40$
 $- (9*\exp(-567/400)*\sin(3213/2000))/8 + 3/8, (51*\cos(323/200)*\exp(-57/40))/40$
 $- (9*\exp(-57/40)*\sin(323/200))/8 + 3/8, (51*\cos(3247/2000)*\exp(-573/400))/40$
 $- (9*\exp(-573/400)*\sin(3247/2000))/8 + 3/8, (51*\cos(204/125)*\exp(-36/25))/40$
 $- (9*\exp(-36/25)*\sin(204/125))/8 + 3/8, (51*\cos(3281/2000)*\exp(-579/400))/40$
 $- (9*\exp(-579/400)*\sin(3281/2000))/8 + 3/8, (51*\cos(1649/1000)*\exp(-$
 $291/200))/40 - (9*\exp(-291/200)*\sin(1649/1000))/8 + 3/8,$
 $(51*\cos(663/400)*\exp(-117/80))/40 - (9*\exp(-117/80)*\sin(663/400))/8 + 3/8,$
 $(51*\cos(833/500)*\exp(-147/100))/40 - (9*\exp(-147/100)*\sin(833/500))/8 + 3/8,$
 $(51*\cos(3349/2000)*\exp(-591/400))/40 - (9*\exp(-591/400)*\sin(3349/2000))/8 +$
 $3/8, (51*\cos(1683/1000)*\exp(-297/200))/40 - (9*\exp(-$
 $297/200)*\sin(1683/1000))/8 + 3/8, (51*\cos(3383/2000)*\exp(-597/400))/40 -$
 $(9*\exp(-597/400)*\sin(3383/2000))/8 + 3/8, (51*\cos(17/10)*\exp(-3/2))/40 -$
 $(9*\exp(-3/2)*\sin(17/10))/8 + 3/8, (51*\cos(3417/2000)*\exp(-603/400))/40 -$
 $(9*\exp(-603/400)*\sin(3417/2000))/8 + 3/8, (51*\cos(1717/1000)*\exp(-$
 $303/200))/40 - (9*\exp(-303/200)*\sin(1717/1000))/8 + 3/8,$
 $(51*\cos(3451/2000)*\exp(-609/400))/40 - (9*\exp(-609/400)*\sin(3451/2000))/8 +$
 $3/8, (51*\cos(867/500)*\exp(-153/100))/40 - (9*\exp(-153/100)*\sin(867/500))/8 +$
 $3/8, (51*\cos(697/400)*\exp(-123/80))/40 - (9*\exp(-123/80)*\sin(697/400))/8 +$
 $3/8, (51*\cos(1751/1000)*\exp(-309/200))/40 - (9*\exp(-$
 $309/200)*\sin(1751/1000))/8 + 3/8, (51*\cos(3519/2000)*\exp(-621/400))/40 -$
 $(9*\exp(-621/400)*\sin(3519/2000))/8 + 3/8, (51*\cos(221/125)*\exp(-39/25))/40 -$
 $(9*\exp(-39/25)*\sin(221/125))/8 + 3/8, (51*\cos(3553/2000)*\exp(-627/400))/40 -$
 $(9*\exp(-627/400)*\sin(3553/2000))/8 + 3/8, (51*\cos(357/200)*\exp(-63/40))/40 -$
 $(9*\exp(-63/40)*\sin(357/200))/8 + 3/8, (51*\cos(3587/2000)*\exp(-633/400))/40 -$
 $(9*\exp(-633/400)*\sin(3587/2000))/8 + 3/8, (51*\cos(901/500)*\exp(-159/100))/40$
 $- (9*\exp(-159/100)*\sin(901/500))/8 + 3/8, (51*\cos(3621/2000)*\exp(-$
 $639/400))/40 - (9*\exp(-639/400)*\sin(3621/2000))/8 + 3/8,$
 $(51*\cos(1819/1000)*\exp(-321/200))/40 - (9*\exp(-321/200)*\sin(1819/1000))/8 +$
 $3/8, (51*\cos(731/400)*\exp(-129/80))/40 - (9*\exp(-129/80)*\sin(731/400))/8 +$
 $3/8, (51*\cos(459/250)*\exp(-81/50))/40 - (9*\exp(-81/50)*\sin(459/250))/8 + 3/8,$
 $(51*\cos(3689/2000)*\exp(-651/400))/40 - (9*\exp(-651/400)*\sin(3689/2000))/8 +$
 $3/8, (51*\cos(1853/1000)*\exp(-327/200))/40 - (9*\exp(-$
 $327/200)*\sin(1853/1000))/8 + 3/8, (51*\cos(3723/2000)*\exp(-657/400))/40 -$
 $(9*\exp(-657/400)*\sin(3723/2000))/8 + 3/8, (51*\cos(187/100)*\exp(-33/20))/40 -$
 $(9*\exp(-33/20)*\sin(187/100))/8 + 3/8, (51*\cos(3757/2000)*\exp(-663/400))/40 -$
 $(9*\exp(-663/400)*\sin(3757/2000))/8 + 3/8, (51*\cos(1887/1000)*\exp(-$
 $333/200))/40 - (9*\exp(-333/200)*\sin(1887/1000))/8 + 3/8,$
 $(51*\cos(3791/2000)*\exp(-669/400))/40 - (9*\exp(-669/400)*\sin(3791/2000))/8 +$
 $3/8, (51*\cos(238/125)*\exp(-42/25))/40 - (9*\exp(-42/25)*\sin(238/125))/8 + 3/8,$
 $(51*\cos(153/80)*\exp(-27/16))/40 - (9*\exp(-27/16)*\sin(153/80))/8 + 3/8,$
 $(51*\cos(1921/1000)*\exp(-339/200))/40 - (9*\exp(-339/200)*\sin(1921/1000))/8 +$
 $3/8, (51*\cos(3859/2000)*\exp(-681/400))/40 - (9*\exp(-$

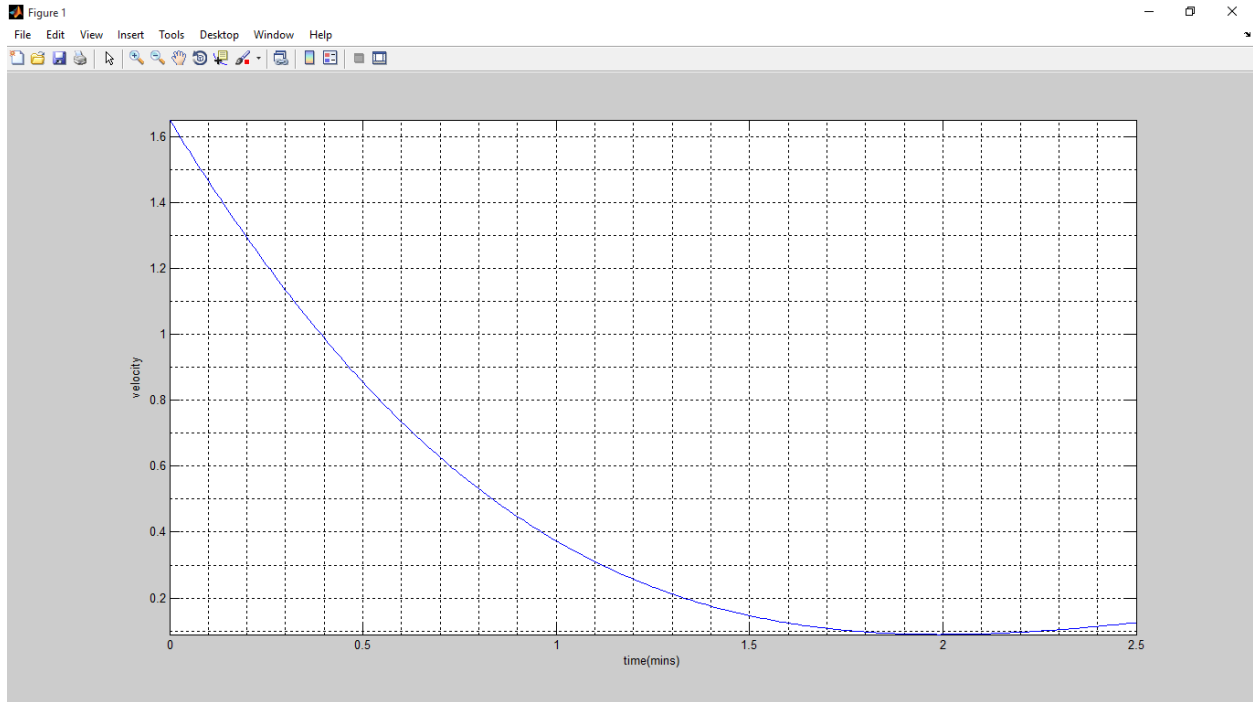
$$\begin{aligned}
& 681/400) * \sin(3859/2000)) / 8 + 3/8, (51 * \cos(969/500) * \exp(-171/100)) / 40 - \\
& (9 * \exp(-171/100) * \sin(969/500)) / 8 + 3/8, (51 * \cos(3893/2000) * \exp(-687/400)) / 40 \\
& - (9 * \exp(-687/400) * \sin(3893/2000)) / 8 + 3/8, (51 * \cos(391/200) * \exp(-69/40)) / 40 \\
& - (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}$$

figure (1)

```

plot(tn,vn)
xlabel('time (mins)')
ylabel('velocity')
axis tight
grid on
grid minor

```



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

```
a =
```

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

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

```
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(-$

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

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

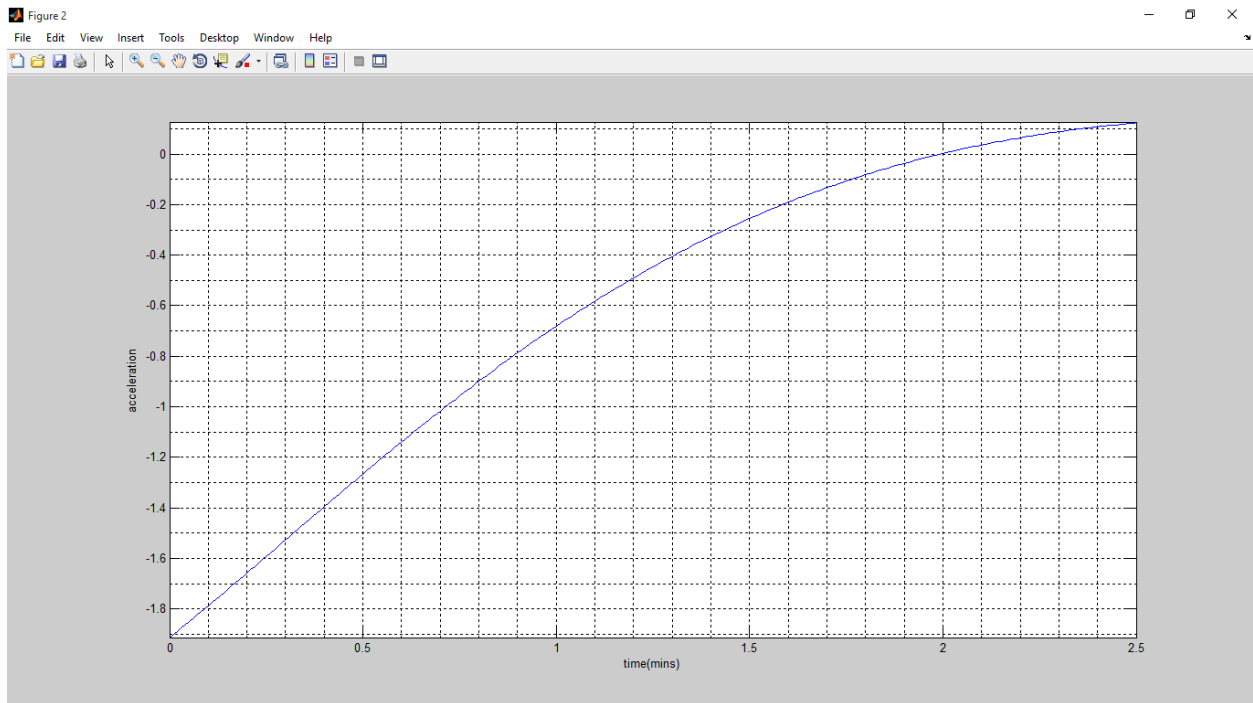
$(6*\exp(-513/400)*\sin(2907/2000))/25, - (153*\cos(731/500)*\exp(-129/100))/80 -$
 $(6*\exp(-129/100)*\sin(731/500))/25, - (153*\cos(2941/2000)*\exp(-519/400))/80 -$
 $(6*\exp(-519/400)*\sin(2941/2000))/25, - (153*\cos(1479/1000)*\exp(-261/200))/80 -$
 $(6*\exp(-261/200)*\sin(1479/1000))/25, - (153*\cos(119/80)*\exp(-21/16))/80 -$
 $(6*\exp(-21/16)*\sin(119/80))/25, - (153*\cos(187/125)*\exp(-33/25))/80 -$
 $(6*\exp(-33/25)*\sin(187/125))/25, - (153*\cos(3009/2000)*\exp(-531/400))/80 -$
 $(6*\exp(-531/400)*\sin(3009/2000))/25, - (153*\cos(1513/1000)*\exp(-267/200))/80 -$
 $(6*\exp(-267/200)*\sin(1513/1000))/25, - (153*\cos(3043/2000)*\exp(-$
 $537/400))/80 - (6*\exp(-537/400)*\sin(3043/2000))/25, - (153*\cos(153/100)*\exp(-$
 $27/20))/80 - (6*\exp(-27/20)*\sin(153/100))/25, - (153*\cos(3077/2000)*\exp(-$
 $543/400))/80 - (6*\exp(-543/400)*\sin(3077/2000))/25, -$
 $(153*\cos(1547/1000)*\exp(-273/200))/80 - (6*\exp(-273/200)*\sin(1547/1000))/25,$
 $- (153*\cos(3111/2000)*\exp(-549/400))/80 - (6*\exp(-$
 $549/400)*\sin(3111/2000))/25, - (153*\cos(391/250)*\exp(-69/50))/80 - (6*\exp(-$
 $69/50)*\sin(391/250))/25, - (153*\cos(629/400)*\exp(-111/80))/80 - (6*\exp(-$
 $111/80)*\sin(629/400))/25, - (153*\cos(1581/1000)*\exp(-279/200))/80 - (6*\exp(-$
 $279/200)*\sin(1581/1000))/25, - (153*\cos(3179/2000)*\exp(-561/400))/80 -$
 $(6*\exp(-561/400)*\sin(3179/2000))/25, - (153*\cos(799/500)*\exp(-141/100))/80 -$
 $(6*\exp(-141/100)*\sin(799/500))/25, - (153*\cos(3213/2000)*\exp(-567/400))/80 -$
 $(6*\exp(-567/400)*\sin(3213/2000))/25, - (153*\cos(323/200)*\exp(-57/40))/80 -$
 $(6*\exp(-57/40)*\sin(323/200))/25, - (153*\cos(3247/2000)*\exp(-573/400))/80 -$
 $(6*\exp(-573/400)*\sin(3247/2000))/25, - (153*\cos(204/125)*\exp(-36/25))/80 -$
 $(6*\exp(-36/25)*\sin(204/125))/25, - (153*\cos(3281/2000)*\exp(-579/400))/80 -$
 $(6*\exp(-579/400)*\sin(3281/2000))/25, - (153*\cos(1649/1000)*\exp(-291/200))/80 -$
 $(6*\exp(-291/200)*\sin(1649/1000))/25, - (153*\cos(663/400)*\exp(-117/80))/80 -$
 $(6*\exp(-117/80)*\sin(663/400))/25, - (153*\cos(833/500)*\exp(-147/100))/80 -$
 $(6*\exp(-147/100)*\sin(833/500))/25, - (153*\cos(3349/2000)*\exp(-591/400))/80 -$
 $(6*\exp(-591/400)*\sin(3349/2000))/25, - (153*\cos(1683/1000)*\exp(-297/200))/80 -$
 $(6*\exp(-297/200)*\sin(1683/1000))/25, - (153*\cos(3383/2000)*\exp(-$
 $597/400))/80 - (6*\exp(-597/400)*\sin(3383/2000))/25, - (153*\cos(17/10)*\exp(-$
 $3/2))/80 - (6*\exp(-3/2)*\sin(17/10))/25, - (153*\cos(3417/2000)*\exp(-$
 $603/400))/80 - (6*\exp(-603/400)*\sin(3417/2000))/25, -$
 $(153*\cos(1717/1000)*\exp(-303/200))/80 - (6*\exp(-303/200)*\sin(1717/1000))/25,$
 $- (153*\cos(3451/2000)*\exp(-609/400))/80 - (6*\exp(-$
 $609/400)*\sin(3451/2000))/25, - (153*\cos(867/500)*\exp(-153/100))/80 - (6*\exp(-$
 $153/100)*\sin(867/500))/25, - (153*\cos(697/400)*\exp(-123/80))/80 - (6*\exp(-$
 $123/80)*\sin(697/400))/25, - (153*\cos(1751/1000)*\exp(-309/200))/80 - (6*\exp(-$
 $309/200)*\sin(1751/1000))/25, - (153*\cos(3519/2000)*\exp(-621/400))/80 -$
 $(6*\exp(-621/400)*\sin(3519/2000))/25, - (153*\cos(221/125)*\exp(-39/25))/80 -$
 $(6*\exp(-39/25)*\sin(221/125))/25, - (153*\cos(3553/2000)*\exp(-627/400))/80 -$
 $(6*\exp(-627/400)*\sin(3553/2000))/25, - (153*\cos(357/200)*\exp(-63/40))/80 -$
 $(6*\exp(-63/40)*\sin(357/200))/25, - (153*\cos(3587/2000)*\exp(-633/400))/80 -$
 $(6*\exp(-633/400)*\sin(3587/2000))/25, - (153*\cos(901/500)*\exp(-159/100))/80 -$
 $(6*\exp(-159/100)*\sin(901/500))/25, - (153*\cos(3621/2000)*\exp(-639/400))/80 -$
 $(6*\exp(-639/400)*\sin(3621/2000))/25, - (153*\cos(1819/1000)*\exp(-321/200))/80 -$
 $(6*\exp(-321/200)*\sin(1819/1000))/25, - (153*\cos(731/400)*\exp(-129/80))/80 -$
 $(6*\exp(-129/80)*\sin(731/400))/25, - (153*\cos(459/250)*\exp(-81/50))/80 -$
 $(6*\exp(-81/50)*\sin(459/250))/25, - (153*\cos(3689/2000)*\exp(-651/400))/80 -$
 $(6*\exp(-651/400)*\sin(3689/2000))/25, - (153*\cos(1853/1000)*\exp(-327/200))/80 -$
 $(6*\exp(-327/200)*\sin(1853/1000))/25, - (153*\cos(3723/2000)*\exp(-$
 $657/400))/80 - (6*\exp(-657/400)*\sin(3723/2000))/25, - (153*\cos(187/100)*\exp(-$
 $33/20))/80 - (6*\exp(-33/20)*\sin(187/100))/25, - (153*\cos(3757/2000)*\exp(-$
 $663/400))/80 - (6*\exp(-663/400)*\sin(3757/2000))/25, -$

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

```

figure (2)
plot(tn,an)
xlabel('time (mins)')
ylabel('acceleration')
axis tight
grid on
grid minor

```



```

figure (3)
plot(tn,vn,tn,an)
xlabel('time(min)')
ylabel('variable')
legend('velocity','acceleration')
axis tight
grid on
grid minor

```

(C)

```

commandwindow
clear
clc
syms x
y=5*sin(5*x)^5
y=

```

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

```
yint= int(y)
```

```
yint =
```

$$(2 \cdot \cos(5 \cdot x)^3)/3 - \cos(5 \cdot x) - \cos(5 \cdot x)^5/5$$

```
yintd=int(y,0,pi)
```

```
yintd =
```

```
16/15
```

```
yintdd=double(yintd)
```

```
yintdd =
```

```
1.0667
```

