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MATRIC NO :16/ENG07/016

COURSE CODE:ENG381

MIDSEMESTER TEST QUESTION 4

Question1

```
commandwindow
```

```
clear
```

```
clc
```

```
syms y(t)
A1 = diff(y,t,1)
A2 = diff(y,t,2)
d = [A2 + (5*A1) + (6*y)== cos(t)]
dy = diff(y,t)
dcond = [y(0)==5,dy(0)==3]
solution = dsolve(d,dcond)
pretty(solution)
tn = [0:0.1:50]
z = subs(solution,tn)
figure(1)
plot(tn,z)
xlabel('time(min)')
ylabel('vibrations')
grid on
grid minor
axis tight
```

```
answer
```

```
A1(t) =
```

```
diff(y(t), t)
```

A2(t) =

diff(y(t), t, t)

d(t) =

6*y(t) + 5*diff(y(t), t) + diff(y(t), t, t) == cos(t)

dy(t) =

diff(y(t), t)

dcond =

[y(0) == 5, subs(diff(y(t), t), t, 0) == 3]

solution =

$$(88 \cdot \exp(-2 \cdot t)) / 5 - (127 \cdot \exp(-3 \cdot t)) / 10 + (2^{1/2} \cdot \cos(t - \pi/4)) / 10$$

$$\frac{\exp(-2 \cdot t) \cdot 88}{5} - \frac{\exp(-3 \cdot t) \cdot 127}{10} + \frac{\sqrt{2} \cdot \cos\left| t - \frac{\pi}{4} \right|}{10}$$

tn =

Columns 1 through 7

0 0.1000 0.2000 0.3000 0.4000 0.5000 0.6000

Columns 8 through 14

0.7000 0.8000 0.9000 1.0000 1.1000 1.2000 1.3000

Columns 15 through 21

1.4000 1.5000 1.6000 1.7000 1.8000 1.9000 2.0000

Columns 22 through 28

2.1000 2.2000 2.3000 2.4000 2.5000 2.6000 2.7000

Columns 29 through 35

2.8000 2.9000 3.0000 3.1000 3.2000 3.3000 3.4000

Columns 36 through 42

3.5000 3.6000 3.7000 3.8000 3.9000 4.0000 4.1000

Columns 43 through 49

4.2000 4.3000 4.4000 4.5000 4.6000 4.7000 4.8000

Columns 50 through 56

4.9000 5.0000 5.1000 5.2000 5.3000 5.4000 5.5000

Columns 57 through 63

5.6000 5.7000 5.8000 5.9000 6.0000 6.1000 6.2000

Columns 64 through 70

6.3000 6.4000 6.5000 6.6000 6.7000 6.8000 6.9000

Columns 71 through 77

7.0000 7.1000 7.2000 7.3000 7.4000 7.5000 7.6000

Columns 78 through 84

7.7000 7.8000 7.9000 8.0000 8.1000 8.2000 8.3000

Columns 85 through 91

8.4000 8.5000 8.6000 8.7000 8.8000 8.9000 9.0000

Columns 92 through 98

9.1000 9.2000 9.3000 9.4000 9.5000 9.6000 9.7000

Columns 99 through 105

9.8000 9.9000 10.0000 10.1000 10.2000 10.3000 10.4000

Columns 106 through 112

10.5000 10.6000 10.7000 10.8000 10.9000 11.0000 11.1000

Columns 113 through 119

11.2000 11.3000 11.4000 11.5000 11.6000 11.7000 11.8000

Columns 120 through 126

11.9000 12.0000 12.1000 12.2000 12.3000 12.4000 12.5000

Columns 127 through 133

12.6000 12.7000 12.8000 12.9000 13.0000 13.1000 13.2000

Columns 134 through 140

13.3000 13.4000 13.5000 13.6000 13.7000 13.8000 13.9000

Columns 141 through 147

14.0000 14.1000 14.2000 14.3000 14.4000 14.5000 14.6000

Columns 148 through 154

14.7000 14.8000 14.9000 15.0000 15.1000 15.2000 15.3000

Columns 155 through 161

15.4000 15.5000 15.6000 15.7000 15.8000 15.9000 16.0000

Columns 162 through 168

16.1000 16.2000 16.3000 16.4000 16.5000 16.6000 16.7000

Columns 169 through 175

16.8000 16.9000 17.0000 17.1000 17.2000 17.3000 17.4000

Columns 176 through 182

17.5000 17.6000 17.7000 17.8000 17.9000 18.0000 18.1000

Columns 183 through 189

18.2000 18.3000 18.4000 18.5000 18.6000 18.7000 18.8000

Columns 190 through 196

18.9000 19.0000 19.1000 19.2000 19.3000 19.4000 19.5000

Columns 197 through 203

19.6000 19.7000 19.8000 19.9000 20.0000 20.1000 20.2000

Columns 204 through 210

20.3000 20.4000 20.5000 20.6000 20.7000 20.8000 20.9000

Columns 211 through 217

21.0000 21.1000 21.2000 21.3000 21.4000 21.5000 21.6000

Columns 218 through 224

21.7000 21.8000 21.9000 22.0000 22.1000 22.2000 22.3000

Columns 225 through 231

22.4000 22.5000 22.6000 22.7000 22.8000 22.9000 23.0000

Columns 232 through 238

23.1000 23.2000 23.3000 23.4000 23.5000 23.6000 23.7000

Columns 239 through 245

23.8000 23.9000 24.0000 24.1000 24.2000 24.3000 24.4000

Columns 246 through 252

24.5000 24.6000 24.7000 24.8000 24.9000 25.0000 25.1000

Columns 253 through 259

25.2000 25.3000 25.4000 25.5000 25.6000 25.7000 25.8000

Columns 260 through 266

25.9000 26.0000 26.1000 26.2000 26.3000 26.4000 26.5000

Columns 267 through 273

26.6000 26.7000 26.8000 26.9000 27.0000 27.1000 27.2000

Columns 274 through 280

27.3000 27.4000 27.5000 27.6000 27.7000 27.8000 27.9000

Columns 281 through 287

28.0000 28.1000 28.2000 28.3000 28.4000 28.5000 28.6000

Columns 288 through 294

28.7000 28.8000 28.9000 29.0000 29.1000 29.2000 29.3000

Columns 295 through 301

29.4000 29.5000 29.6000 29.7000 29.8000 29.9000 30.0000

Columns 302 through 308

30.1000 30.2000 30.3000 30.4000 30.5000 30.6000 30.7000

Columns 309 through 315

30.8000 30.9000 31.0000 31.1000 31.2000 31.3000 31.4000

Columns 316 through 322

31.5000 31.6000 31.7000 31.8000 31.9000 32.0000 32.1000

Columns 323 through 329

32.2000 32.3000 32.4000 32.5000 32.6000 32.7000 32.8000

Columns 330 through 336

32.9000 33.0000 33.1000 33.2000 33.3000 33.4000 33.5000

Columns 337 through 343

33.6000 33.7000 33.8000 33.9000 34.0000 34.1000 34.2000

Columns 344 through 350

34.3000 34.4000 34.5000 34.6000 34.7000 34.8000 34.9000

Columns 351 through 357

35.0000 35.1000 35.2000 35.3000 35.4000 35.5000 35.6000

Columns 358 through 364

35.7000 35.8000 35.9000 36.0000 36.1000 36.2000 36.3000

Columns 365 through 371

36.4000 36.5000 36.6000 36.7000 36.8000 36.9000 37.0000

Columns 372 through 378

37.1000 37.2000 37.3000 37.4000 37.5000 37.6000 37.7000

Columns 379 through 385

37.8000 37.9000 38.0000 38.1000 38.2000 38.3000 38.4000

Columns 386 through 392

38.5000 38.6000 38.7000 38.8000 38.9000 39.0000 39.1000

Columns 393 through 399

39.2000 39.3000 39.4000 39.5000 39.6000 39.7000 39.8000

Columns 400 through 406

39.9000 40.0000 40.1000 40.2000 40.3000 40.4000 40.5000

Columns 407 through 413

40.6000 40.7000 40.8000 40.9000 41.0000 41.1000 41.2000

Columns 414 through 420

41.3000 41.4000 41.5000 41.6000 41.7000 41.8000 41.9000

Columns 421 through 427

42.0000 42.1000 42.2000 42.3000 42.4000 42.5000 42.6000

Columns 428 through 434

42.7000 42.8000 42.9000 43.0000 43.1000 43.2000 43.3000

Columns 435 through 441

43.4000 43.5000 43.6000 43.7000 43.8000 43.9000 44.0000

Columns 442 through 448

44.1000 44.2000 44.3000 44.4000 44.5000 44.6000 44.7000

Columns 449 through 455

44.8000 44.9000 45.0000 45.1000 45.2000 45.3000 45.4000

Columns 456 through 462

45.5000 45.6000 45.7000 45.8000 45.9000 46.0000 46.1000

Columns 463 through 469

46.2000 46.3000 46.4000 46.5000 46.6000 46.7000 46.8000

Columns 470 through 476

46.9000 47.0000 47.1000 47.2000 47.3000 47.4000 47.5000

Columns 477 through 483

47.6000 47.7000 47.8000 47.9000 48.0000 48.1000 48.2000

Columns 484 through 490

48.3000 48.4000 48.5000 48.6000 48.7000 48.8000 48.9000

Columns 491 through 497

49.0000 49.1000 49.2000 49.3000 49.4000 49.5000 49.6000

Columns 498 through 501

49.7000 49.8000 49.9000 50.0000

z =

[5, (88*exp(-1/5))/5 - (127*exp(-3/10))/10 + (2^(1/2)*cos(pi/4 - 1/10))/10,
(88*exp(-2/5))/5 - (127*exp(-3/5))/10 + (2^(1/2)*cos(pi/4 - 1/5))/10, (88*exp(-
3/5))/5 - (127*exp(-9/10))/10 + (2^(1/2)*cos(pi/4 - 3/10))/10, (88*exp(-4/5))/5 -
(127*exp(-6/5))/10 + (2^(1/2)*cos(pi/4 - 2/5))/10, (88*exp(-1))/5 - (127*exp(-
3/2))/10 + (2^(1/2)*cos(pi/4 - 1/2))/10, (88*exp(-6/5))/5 - (127*exp(-9/5))/10 +
(2^(1/2)*cos(pi/4 - 3/5))/10, (88*exp(-7/5))/5 - (127*exp(-21/10))/10 +
(2^(1/2)*cos(pi/4 - 7/10))/10, (88*exp(-8/5))/5 - (127*exp(-12/5))/10 +
(2^(1/2)*cos(pi/4 - 4/5))/10, (88*exp(-9/5))/5 - (127*exp(-27/10))/10 +
(2^(1/2)*cos(pi/4 - 9/10))/10, (88*exp(-2))/5 - (127*exp(-3))/10 +
(2^(1/2)*cos(pi/4 - 1))/10, (88*exp(-11/5))/5 - (127*exp(-33/10))/10 +
(2^(1/2)*cos(pi/4 - 11/10))/10, (88*exp(-12/5))/5 - (127*exp(-18/5))/10 +

$(2^{1/2} \cos(\pi/4 - 6/5))/10, (88 \exp(-13/5))/5 - (127 \exp(-39/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 13/10))/10, (88 \exp(-14/5))/5 - (127 \exp(-21/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 7/5))/10, (88 \exp(-3))/5 - (127 \exp(-9/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 3/2))/10, (88 \exp(-16/5))/5 - (127 \exp(-24/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 8/5))/10, (88 \exp(-17/5))/5 - (127 \exp(-51/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 17/10))/10, (88 \exp(-18/5))/5 - (127 \exp(-27/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 9/5))/10, (88 \exp(-19/5))/5 - (127 \exp(-57/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 19/10))/10, (88 \exp(-4))/5 - (127 \exp(-6))/10 +$
 $(2^{1/2} \cos(\pi/4 - 2))/10, (88 \exp(-21/5))/5 - (127 \exp(-63/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 21/10))/10, (88 \exp(-22/5))/5 - (127 \exp(-33/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 11/5))/10, (88 \exp(-23/5))/5 - (127 \exp(-69/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 23/10))/10, (88 \exp(-24/5))/5 - (127 \exp(-36/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 12/5))/10, (88 \exp(-5))/5 - (127 \exp(-15/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 5/2))/10, (88 \exp(-26/5))/5 - (127 \exp(-39/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 13/5))/10, (88 \exp(-27/5))/5 - (127 \exp(-81/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 27/10))/10, (88 \exp(-28/5))/5 - (127 \exp(-42/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 14/5))/10, (88 \exp(-29/5))/5 - (127 \exp(-87/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 29/10))/10, (88 \exp(-6))/5 - (127 \exp(-9))/10 +$
 $(2^{1/2} \cos(\pi/4 - 3))/10, (88 \exp(-31/5))/5 - (127 \exp(-93/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 31/10))/10, (88 \exp(-32/5))/5 - (127 \exp(-48/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 16/5))/10, (88 \exp(-33/5))/5 - (127 \exp(-99/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 33/10))/10, (88 \exp(-34/5))/5 - (127 \exp(-51/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 17/5))/10, (88 \exp(-7))/5 - (127 \exp(-21/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 7/2))/10, (88 \exp(-36/5))/5 - (127 \exp(-54/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 18/5))/10, (88 \exp(-37/5))/5 - (127 \exp(-111/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 37/10))/10, (88 \exp(-38/5))/5 - (127 \exp(-57/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 19/5))/10, (88 \exp(-39/5))/5 - (127 \exp(-117/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 39/10))/10, (88 \exp(-8))/5 - (127 \exp(-12))/10 +$
 $(2^{1/2} \cos(\pi/4 - 4))/10, (88 \exp(-41/5))/5 - (127 \exp(-123/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 41/10))/10, (88 \exp(-42/5))/5 - (127 \exp(-63/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 21/5))/10, (88 \exp(-43/5))/5 - (127 \exp(-129/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 43/10))/10, (88 \exp(-44/5))/5 - (127 \exp(-66/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 22/5))/10, (88 \exp(-9))/5 - (127 \exp(-27/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 9/2))/10, (88 \exp(-46/5))/5 - (127 \exp(-69/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 23/5))/10, (88 \exp(-47/5))/5 - (127 \exp(-141/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 47/10))/10, (88 \exp(-48/5))/5 - (127 \exp(-72/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 24/5))/10, (88 \exp(-49/5))/5 - (127 \exp(-147/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 49/10))/10, (88 \exp(-10))/5 - (127 \exp(-15))/10 +$
 $(2^{1/2} \cos(\pi/4 - 5))/10, (88 \exp(-51/5))/5 - (127 \exp(-153/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 51/10))/10, (88 \exp(-52/5))/5 - (127 \exp(-78/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 26/5))/10, (88 \exp(-53/5))/5 - (127 \exp(-159/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 53/10))/10, (88 \exp(-54/5))/5 - (127 \exp(-81/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 27/5))/10, (88 \exp(-11))/5 - (127 \exp(-33/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 11/2))/10, (88 \exp(-56/5))/5 - (127 \exp(-84/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 28/5))/10, (88 \exp(-57/5))/5 - (127 \exp(-171/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 57/10))/10, (88 \exp(-58/5))/5 - (127 \exp(-87/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 29/5))/10, (88 \exp(-59/5))/5 - (127 \exp(-177/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 59/10))/10, (88 \exp(-12))/5 - (127 \exp(-18))/10 +$
 $(2^{1/2} \cos(\pi/4 - 6))/10, (88 \exp(-61/5))/5 - (127 \exp(-183/10))/10 +$

$(2^{1/2} \cos(\pi/4 - 61/10))/10, (88 \exp(-62/5))/5 - (127 \exp(-93/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 31/5))/10, (88 \exp(-63/5))/5 - (127 \exp(-189/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 63/10))/10, (88 \exp(-64/5))/5 - (127 \exp(-96/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 32/5))/10, (88 \exp(-13))/5 - (127 \exp(-39/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 13/2))/10, (88 \exp(-66/5))/5 - (127 \exp(-99/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 33/5))/10, (88 \exp(-67/5))/5 - (127 \exp(-201/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 67/10))/10, (88 \exp(-68/5))/5 - (127 \exp(-102/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 34/5))/10, (88 \exp(-69/5))/5 - (127 \exp(-207/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 69/10))/10, (88 \exp(-14))/5 - (127 \exp(-21))/10 +$
 $(2^{1/2} \cos(\pi/4 - 7))/10, (88 \exp(-71/5))/5 - (127 \exp(-213/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 71/10))/10, (88 \exp(-72/5))/5 - (127 \exp(-108/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 36/5))/10, (88 \exp(-73/5))/5 - (127 \exp(-219/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 73/10))/10, (88 \exp(-74/5))/5 - (127 \exp(-111/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 37/5))/10, (88 \exp(-15))/5 - (127 \exp(-45/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 15/2))/10, (88 \exp(-76/5))/5 - (127 \exp(-114/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 38/5))/10, (88 \exp(-77/5))/5 - (127 \exp(-231/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 77/10))/10, (88 \exp(-78/5))/5 - (127 \exp(-117/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 39/5))/10, (88 \exp(-79/5))/5 - (127 \exp(-237/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 79/10))/10, (88 \exp(-16))/5 - (127 \exp(-24))/10 +$
 $(2^{1/2} \cos(\pi/4 - 8))/10, (88 \exp(-81/5))/5 - (127 \exp(-243/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 81/10))/10, (88 \exp(-82/5))/5 - (127 \exp(-123/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 41/5))/10, (88 \exp(-83/5))/5 - (127 \exp(-249/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 83/10))/10, (88 \exp(-84/5))/5 - (127 \exp(-126/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 42/5))/10, (88 \exp(-17))/5 - (127 \exp(-51/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 17/2))/10, (88 \exp(-86/5))/5 - (127 \exp(-129/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 43/5))/10, (88 \exp(-87/5))/5 - (127 \exp(-261/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 87/10))/10, (88 \exp(-88/5))/5 - (127 \exp(-132/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 44/5))/10, (88 \exp(-89/5))/5 - (127 \exp(-267/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 89/10))/10, (88 \exp(-18))/5 - (127 \exp(-27))/10 +$
 $(2^{1/2} \cos(\pi/4 - 9))/10, (88 \exp(-91/5))/5 - (127 \exp(-273/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 91/10))/10, (88 \exp(-92/5))/5 - (127 \exp(-138/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 46/5))/10, (88 \exp(-93/5))/5 - (127 \exp(-279/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 93/10))/10, (88 \exp(-94/5))/5 - (127 \exp(-141/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 47/5))/10, (88 \exp(-19))/5 - (127 \exp(-57/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 19/2))/10, (88 \exp(-96/5))/5 - (127 \exp(-144/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 48/5))/10, (88 \exp(-97/5))/5 - (127 \exp(-291/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 97/10))/10, (88 \exp(-98/5))/5 - (127 \exp(-147/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 49/5))/10, (88 \exp(-99/5))/5 - (127 \exp(-297/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 99/10))/10, (88 \exp(-20))/5 - (127 \exp(-30))/10 +$
 $(2^{1/2} \cos(\pi/4 - 10))/10, (88 \exp(-101/5))/5 - (127 \exp(-303/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 101/10))/10, (88 \exp(-102/5))/5 - (127 \exp(-153/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 51/5))/10, (88 \exp(-103/5))/5 - (127 \exp(-309/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 103/10))/10, (88 \exp(-104/5))/5 - (127 \exp(-156/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 52/5))/10, (88 \exp(-21))/5 - (127 \exp(-63/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 21/2))/10, (88 \exp(-106/5))/5 - (127 \exp(-159/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 53/5))/10, (88 \exp(-107/5))/5 - (127 \exp(-321/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 107/10))/10, (88 \exp(-108/5))/5 - (127 \exp(-162/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 54/5))/10, (88 \exp(-109/5))/5 - (127 \exp(-327/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 109/10))/10, (88 \exp(-22))/5 - (127 \exp(-33))/10 +$

$(2^{(1/2)} \cos(\pi/4 - 11))/10, (88 \exp(-111/5))/5 - (127 \exp(-333/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 111/10))/10, (88 \exp(-112/5))/5 - (127 \exp(-168/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 56/5))/10, (88 \exp(-113/5))/5 - (127 \exp(-339/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 113/10))/10, (88 \exp(-114/5))/5 - (127 \exp(-171/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 57/5))/10, (88 \exp(-23))/5 - (127 \exp(-69/2))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 23/2))/10, (88 \exp(-116/5))/5 - (127 \exp(-174/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 58/5))/10, (88 \exp(-117/5))/5 - (127 \exp(-351/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 117/10))/10, (88 \exp(-118/5))/5 - (127 \exp(-177/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 59/5))/10, (88 \exp(-119/5))/5 - (127 \exp(-357/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 119/10))/10, (88 \exp(-24))/5 - (127 \exp(-36))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 12))/10, (88 \exp(-121/5))/5 - (127 \exp(-363/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 121/10))/10, (88 \exp(-122/5))/5 - (127 \exp(-183/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 61/5))/10, (88 \exp(-123/5))/5 - (127 \exp(-369/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 123/10))/10, (88 \exp(-124/5))/5 - (127 \exp(-186/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 62/5))/10, (88 \exp(-25))/5 - (127 \exp(-75/2))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 25/2))/10, (88 \exp(-126/5))/5 - (127 \exp(-189/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 63/5))/10, (88 \exp(-127/5))/5 - (127 \exp(-381/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 127/10))/10, (88 \exp(-128/5))/5 - (127 \exp(-192/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 64/5))/10, (88 \exp(-129/5))/5 - (127 \exp(-387/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 129/10))/10, (88 \exp(-26))/5 - (127 \exp(-39))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 13))/10, (88 \exp(-131/5))/5 - (127 \exp(-393/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 131/10))/10, (88 \exp(-132/5))/5 - (127 \exp(-198/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 66/5))/10, (88 \exp(-133/5))/5 - (127 \exp(-399/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 133/10))/10, (88 \exp(-134/5))/5 - (127 \exp(-201/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 67/5))/10, (88 \exp(-27))/5 - (127 \exp(-81/2))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 27/2))/10, (88 \exp(-136/5))/5 - (127 \exp(-204/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 68/5))/10, (88 \exp(-137/5))/5 - (127 \exp(-411/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 137/10))/10, (88 \exp(-138/5))/5 - (127 \exp(-207/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 69/5))/10, (88 \exp(-139/5))/5 - (127 \exp(-417/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 139/10))/10, (88 \exp(-28))/5 - (127 \exp(-42))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 14))/10, (88 \exp(-141/5))/5 - (127 \exp(-423/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 141/10))/10, (88 \exp(-142/5))/5 - (127 \exp(-213/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 71/5))/10, (88 \exp(-143/5))/5 - (127 \exp(-429/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 143/10))/10, (88 \exp(-144/5))/5 - (127 \exp(-216/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 72/5))/10, (88 \exp(-29))/5 - (127 \exp(-87/2))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 29/2))/10, (88 \exp(-146/5))/5 - (127 \exp(-219/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 73/5))/10, (88 \exp(-147/5))/5 - (127 \exp(-441/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 147/10))/10, (88 \exp(-148/5))/5 - (127 \exp(-222/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 74/5))/10, (88 \exp(-149/5))/5 - (127 \exp(-447/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 149/10))/10, (88 \exp(-30))/5 - (127 \exp(-45))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 15))/10, (88 \exp(-151/5))/5 - (127 \exp(-453/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 151/10))/10, (88 \exp(-152/5))/5 - (127 \exp(-228/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 76/5))/10, (88 \exp(-153/5))/5 - (127 \exp(-459/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 153/10))/10, (88 \exp(-154/5))/5 - (127 \exp(-231/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 77/5))/10, (88 \exp(-31))/5 - (127 \exp(-93/2))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 31/2))/10, (88 \exp(-156/5))/5 - (127 \exp(-234/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 78/5))/10, (88 \exp(-157/5))/5 - (127 \exp(-471/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 157/10))/10, (88 \exp(-158/5))/5 - (127 \exp(-237/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 79/5))/10, (88 \exp(-159/5))/5 - (127 \exp(-477/10))/10 +$

$(2^{1/2} \cos(\pi/4 - 159/10))/10, (88 \exp(-32))/5 - (127 \exp(-48))/10 +$
 $(2^{1/2} \cos(\pi/4 - 16))/10, (88 \exp(-161/5))/5 - (127 \exp(-483/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 161/10))/10, (88 \exp(-162/5))/5 - (127 \exp(-243/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 81/5))/10, (88 \exp(-163/5))/5 - (127 \exp(-489/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 163/10))/10, (88 \exp(-164/5))/5 - (127 \exp(-246/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 82/5))/10, (88 \exp(-33))/5 - (127 \exp(-99/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 33/2))/10, (88 \exp(-166/5))/5 - (127 \exp(-249/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 83/5))/10, (88 \exp(-167/5))/5 - (127 \exp(-501/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 167/10))/10, (88 \exp(-168/5))/5 - (127 \exp(-252/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 84/5))/10, (88 \exp(-169/5))/5 - (127 \exp(-507/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 169/10))/10, (88 \exp(-34))/5 - (127 \exp(-51))/10 +$
 $(2^{1/2} \cos(\pi/4 - 17))/10, (88 \exp(-171/5))/5 - (127 \exp(-513/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 171/10))/10, (88 \exp(-172/5))/5 - (127 \exp(-258/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 86/5))/10, (88 \exp(-173/5))/5 - (127 \exp(-519/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 173/10))/10, (88 \exp(-174/5))/5 - (127 \exp(-261/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 87/5))/10, (88 \exp(-35))/5 - (127 \exp(-105/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 35/2))/10, (88 \exp(-176/5))/5 - (127 \exp(-264/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 88/5))/10, (88 \exp(-177/5))/5 - (127 \exp(-531/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 177/10))/10, (88 \exp(-178/5))/5 - (127 \exp(-267/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 89/5))/10, (88 \exp(-179/5))/5 - (127 \exp(-537/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 179/10))/10, (88 \exp(-36))/5 - (127 \exp(-54))/10 +$
 $(2^{1/2} \cos(\pi/4 - 18))/10, (88 \exp(-181/5))/5 - (127 \exp(-543/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 181/10))/10, (88 \exp(-182/5))/5 - (127 \exp(-273/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 91/5))/10, (88 \exp(-183/5))/5 - (127 \exp(-549/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 183/10))/10, (88 \exp(-184/5))/5 - (127 \exp(-276/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 92/5))/10, (88 \exp(-37))/5 - (127 \exp(-111/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 37/2))/10, (88 \exp(-186/5))/5 - (127 \exp(-279/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 93/5))/10, (88 \exp(-187/5))/5 - (127 \exp(-561/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 187/10))/10, (88 \exp(-188/5))/5 - (127 \exp(-282/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 94/5))/10, (88 \exp(-189/5))/5 - (127 \exp(-567/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 189/10))/10, (88 \exp(-38))/5 - (127 \exp(-57))/10 +$
 $(2^{1/2} \cos(\pi/4 - 19))/10, (88 \exp(-191/5))/5 - (127 \exp(-573/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 191/10))/10, (88 \exp(-192/5))/5 - (127 \exp(-288/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 96/5))/10, (88 \exp(-193/5))/5 - (127 \exp(-579/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 193/10))/10, (88 \exp(-194/5))/5 - (127 \exp(-291/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 97/5))/10, (88 \exp(-39))/5 - (127 \exp(-117/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 39/2))/10, (88 \exp(-196/5))/5 - (127 \exp(-294/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 98/5))/10, (88 \exp(-197/5))/5 - (127 \exp(-591/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 197/10))/10, (88 \exp(-198/5))/5 - (127 \exp(-297/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 99/5))/10, (88 \exp(-199/5))/5 - (127 \exp(-597/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 199/10))/10, (88 \exp(-40))/5 - (127 \exp(-60))/10 +$
 $(2^{1/2} \cos(\pi/4 - 20))/10, (88 \exp(-201/5))/5 - (127 \exp(-603/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 201/10))/10, (88 \exp(-202/5))/5 - (127 \exp(-303/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 101/5))/10, (88 \exp(-203/5))/5 - (127 \exp(-609/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 203/10))/10, (88 \exp(-204/5))/5 - (127 \exp(-306/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 102/5))/10, (88 \exp(-41))/5 - (127 \exp(-123/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 41/2))/10, (88 \exp(-206/5))/5 - (127 \exp(-309/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 103/5))/10, (88 \exp(-207/5))/5 - (127 \exp(-621/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 207/10))/10, (88 \exp(-208/5))/5 - (127 \exp(-312/5))/10 +$

$(2^{1/2} \cos(\pi/4 - 104/5))/10, (88 \exp(-209/5))/5 - (127 \exp(-627/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 209/10))/10, (88 \exp(-42))/5 - (127 \exp(-63))/10 +$
 $(2^{1/2} \cos(\pi/4 - 21))/10, (88 \exp(-211/5))/5 - (127 \exp(-633/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 211/10))/10, (88 \exp(-212/5))/5 - (127 \exp(-318/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 106/5))/10, (88 \exp(-213/5))/5 - (127 \exp(-639/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 213/10))/10, (88 \exp(-214/5))/5 - (127 \exp(-321/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 107/5))/10, (88 \exp(-43))/5 - (127 \exp(-129/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 43/2))/10, (88 \exp(-216/5))/5 - (127 \exp(-324/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 108/5))/10, (88 \exp(-217/5))/5 - (127 \exp(-651/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 217/10))/10, (88 \exp(-218/5))/5 - (127 \exp(-327/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 109/5))/10, (88 \exp(-219/5))/5 - (127 \exp(-657/10))/10 +$
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 $(2^{1/2} \cos(\pi/4 - 22))/10, (88 \exp(-221/5))/5 - (127 \exp(-663/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 221/10))/10, (88 \exp(-222/5))/5 - (127 \exp(-333/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 111/5))/10, (88 \exp(-223/5))/5 - (127 \exp(-669/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 223/10))/10, (88 \exp(-224/5))/5 - (127 \exp(-336/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 112/5))/10, (88 \exp(-45))/5 - (127 \exp(-135/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 45/2))/10, (88 \exp(-226/5))/5 - (127 \exp(-339/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 113/5))/10, (88 \exp(-227/5))/5 - (127 \exp(-681/10))/10 +$
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 $(2^{1/2} \cos(\pi/4 - 23))/10, (88 \exp(-231/5))/5 - (127 \exp(-693/10))/10 +$
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 $(2^{1/2} \cos(\pi/4 - 116/5))/10, (88 \exp(-233/5))/5 - (127 \exp(-699/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 233/10))/10, (88 \exp(-234/5))/5 - (127 \exp(-351/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 117/5))/10, (88 \exp(-47))/5 - (127 \exp(-141/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 47/2))/10, (88 \exp(-236/5))/5 - (127 \exp(-354/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 118/5))/10, (88 \exp(-237/5))/5 - (127 \exp(-711/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 237/10))/10, (88 \exp(-238/5))/5 - (127 \exp(-357/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 119/5))/10, (88 \exp(-239/5))/5 - (127 \exp(-717/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 239/10))/10, (88 \exp(-48))/5 - (127 \exp(-72))/10 +$
 $(2^{1/2} \cos(\pi/4 - 24))/10, (88 \exp(-241/5))/5 - (127 \exp(-723/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 241/10))/10, (88 \exp(-242/5))/5 - (127 \exp(-363/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 121/5))/10, (88 \exp(-243/5))/5 - (127 \exp(-729/10))/10 +$
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 $(2^{1/2} \cos(\pi/4 - 123/5))/10, (88 \exp(-247/5))/5 - (127 \exp(-741/10))/10 +$
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 $(2^{1/2} \cos(\pi/4 - 124/5))/10, (88 \exp(-249/5))/5 - (127 \exp(-747/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 249/10))/10, (88 \exp(-50))/5 - (127 \exp(-75))/10 +$
 $(2^{1/2} \cos(\pi/4 - 25))/10, (88 \exp(-251/5))/5 - (127 \exp(-753/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 251/10))/10, (88 \exp(-252/5))/5 - (127 \exp(-378/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 126/5))/10, (88 \exp(-253/5))/5 - (127 \exp(-759/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 253/10))/10, (88 \exp(-254/5))/5 - (127 \exp(-381/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 127/5))/10, (88 \exp(-51))/5 - (127 \exp(-153/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 51/2))/10, (88 \exp(-256/5))/5 - (127 \exp(-384/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 128/5))/10, (88 \exp(-257/5))/5 - (127 \exp(-771/10))/10 +$

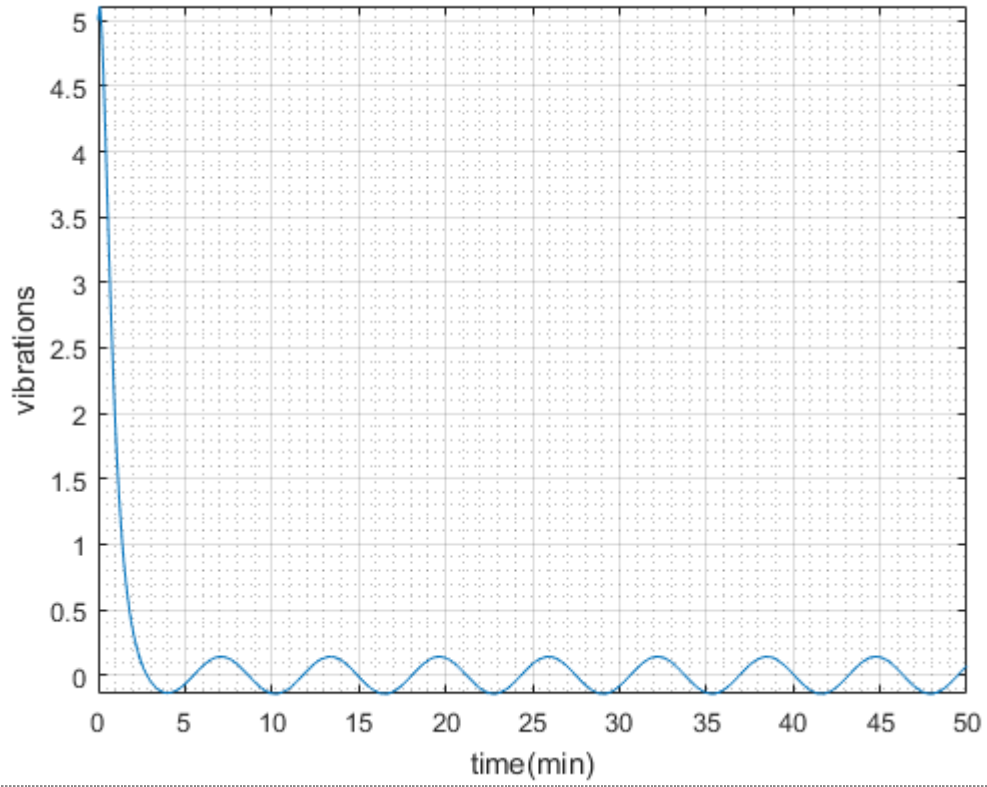
$(2^{1/2} \cos(\pi/4 - 257/10))/10, (88 \exp(-258/5))/5 - (127 \exp(-387/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 129/5))/10, (88 \exp(-259/5))/5 - (127 \exp(-777/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 259/10))/10, (88 \exp(-52))/5 - (127 \exp(-78))/10 +$
 $(2^{1/2} \cos(\pi/4 - 26))/10, (88 \exp(-261/5))/5 - (127 \exp(-783/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 261/10))/10, (88 \exp(-262/5))/5 - (127 \exp(-393/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 131/5))/10, (88 \exp(-263/5))/5 - (127 \exp(-789/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 263/10))/10, (88 \exp(-264/5))/5 - (127 \exp(-396/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 132/5))/10, (88 \exp(-53))/5 - (127 \exp(-159/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 53/2))/10, (88 \exp(-266/5))/5 - (127 \exp(-399/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 133/5))/10, (88 \exp(-267/5))/5 - (127 \exp(-801/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 267/10))/10, (88 \exp(-268/5))/5 - (127 \exp(-402/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 134/5))/10, (88 \exp(-269/5))/5 - (127 \exp(-807/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 269/10))/10, (88 \exp(-54))/5 - (127 \exp(-81))/10 +$
 $(2^{1/2} \cos(\pi/4 - 27))/10, (88 \exp(-271/5))/5 - (127 \exp(-813/10))/10 +$
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 $(2^{1/2} \cos(\pi/4 - 136/5))/10, (88 \exp(-273/5))/5 - (127 \exp(-819/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 273/10))/10, (88 \exp(-274/5))/5 - (127 \exp(-411/5))/10 +$
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 $(2^{1/2} \cos(\pi/4 - 55/2))/10, (88 \exp(-276/5))/5 - (127 \exp(-414/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 138/5))/10, (88 \exp(-277/5))/5 - (127 \exp(-831/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 277/10))/10, (88 \exp(-278/5))/5 - (127 \exp(-417/5))/10 +$
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 $(2^{1/2} \cos(\pi/4 - 281/10))/10, (88 \exp(-282/5))/5 - (127 \exp(-423/5))/10 +$
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 $(2^{1/2} \cos(\pi/4 - 283/10))/10, (88 \exp(-284/5))/5 - (127 \exp(-426/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 142/5))/10, (88 \exp(-57))/5 - (127 \exp(-171/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 57/2))/10, (88 \exp(-286/5))/5 - (127 \exp(-429/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 143/5))/10, (88 \exp(-287/5))/5 - (127 \exp(-861/10))/10 +$
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 $(2^{1/2} \cos(\pi/4 - 289/10))/10, (88 \exp(-58))/5 - (127 \exp(-87))/10 +$
 $(2^{1/2} \cos(\pi/4 - 29))/10, (88 \exp(-291/5))/5 - (127 \exp(-873/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 291/10))/10, (88 \exp(-292/5))/5 - (127 \exp(-438/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 146/5))/10, (88 \exp(-293/5))/5 - (127 \exp(-879/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 293/10))/10, (88 \exp(-294/5))/5 - (127 \exp(-441/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 147/5))/10, (88 \exp(-59))/5 - (127 \exp(-177/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 59/2))/10, (88 \exp(-296/5))/5 - (127 \exp(-444/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 148/5))/10, (88 \exp(-297/5))/5 - (127 \exp(-891/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 297/10))/10, (88 \exp(-298/5))/5 - (127 \exp(-447/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 149/5))/10, (88 \exp(-299/5))/5 - (127 \exp(-897/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 299/10))/10, (88 \exp(-60))/5 - (127 \exp(-90))/10 +$
 $(2^{1/2} \cos(\pi/4 - 30))/10, (88 \exp(-301/5))/5 - (127 \exp(-903/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 301/10))/10, (88 \exp(-302/5))/5 - (127 \exp(-453/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 151/5))/10, (88 \exp(-303/5))/5 - (127 \exp(-909/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 303/10))/10, (88 \exp(-304/5))/5 - (127 \exp(-456/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 152/5))/10, (88 \exp(-61))/5 - (127 \exp(-183/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 61/2))/10, (88 \exp(-306/5))/5 - (127 \exp(-459/5))/10 +$

$(2^{1/2} \cos(\pi/4 - 153/5))/10, (88 \exp(-307/5))/5 - (127 \exp(-921/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 307/10))/10, (88 \exp(-308/5))/5 - (127 \exp(-462/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 154/5))/10, (88 \exp(-309/5))/5 - (127 \exp(-927/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 309/10))/10, (88 \exp(-62))/5 - (127 \exp(-93))/10 +$
 $(2^{1/2} \cos(\pi/4 - 31))/10, (88 \exp(-311/5))/5 - (127 \exp(-933/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 311/10))/10, (88 \exp(-312/5))/5 - (127 \exp(-468/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 156/5))/10, (88 \exp(-313/5))/5 - (127 \exp(-939/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 313/10))/10, (88 \exp(-314/5))/5 - (127 \exp(-471/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 157/5))/10, (88 \exp(-63))/5 - (127 \exp(-189/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 63/2))/10, (88 \exp(-316/5))/5 - (127 \exp(-474/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 158/5))/10, (88 \exp(-317/5))/5 - (127 \exp(-951/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 317/10))/10, (88 \exp(-318/5))/5 - (127 \exp(-477/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 159/5))/10, (88 \exp(-319/5))/5 - (127 \exp(-957/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 319/10))/10, (88 \exp(-64))/5 - (127 \exp(-96))/10 +$
 $(2^{1/2} \cos(\pi/4 - 32))/10, (88 \exp(-321/5))/5 - (127 \exp(-963/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 321/10))/10, (88 \exp(-322/5))/5 - (127 \exp(-483/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 161/5))/10, (88 \exp(-323/5))/5 - (127 \exp(-969/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 323/10))/10, (88 \exp(-324/5))/5 - (127 \exp(-486/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 162/5))/10, (88 \exp(-65))/5 - (127 \exp(-195/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 65/2))/10, (88 \exp(-326/5))/5 - (127 \exp(-489/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 163/5))/10, (88 \exp(-327/5))/5 - (127 \exp(-981/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 327/10))/10, (88 \exp(-328/5))/5 - (127 \exp(-492/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 164/5))/10, (88 \exp(-329/5))/5 - (127 \exp(-987/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 329/10))/10, (88 \exp(-66))/5 - (127 \exp(-99))/10 +$
 $(2^{1/2} \cos(\pi/4 - 33))/10, (88 \exp(-331/5))/5 - (127 \exp(-993/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 331/10))/10, (88 \exp(-332/5))/5 - (127 \exp(-498/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 166/5))/10, (88 \exp(-333/5))/5 - (127 \exp(-999/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 333/10))/10, (88 \exp(-334/5))/5 - (127 \exp(-501/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 167/5))/10, (88 \exp(-67))/5 - (127 \exp(-201/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 67/2))/10, (88 \exp(-336/5))/5 - (127 \exp(-504/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 168/5))/10, (88 \exp(-337/5))/5 - (127 \exp(-1011/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 337/10))/10, (88 \exp(-338/5))/5 - (127 \exp(-507/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 169/5))/10, (88 \exp(-339/5))/5 - (127 \exp(-1017/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 339/10))/10, (88 \exp(-68))/5 - (127 \exp(-102))/10 +$
 $(2^{1/2} \cos(\pi/4 - 34))/10, (88 \exp(-341/5))/5 - (127 \exp(-1023/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 341/10))/10, (88 \exp(-342/5))/5 - (127 \exp(-513/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 171/5))/10, (88 \exp(-343/5))/5 - (127 \exp(-1029/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 343/10))/10, (88 \exp(-344/5))/5 - (127 \exp(-516/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 172/5))/10, (88 \exp(-69))/5 - (127 \exp(-207/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 69/2))/10, (88 \exp(-346/5))/5 - (127 \exp(-519/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 173/5))/10, (88 \exp(-347/5))/5 - (127 \exp(-1041/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 347/10))/10, (88 \exp(-348/5))/5 - (127 \exp(-522/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 174/5))/10, (88 \exp(-349/5))/5 - (127 \exp(-1047/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 349/10))/10, (88 \exp(-70))/5 - (127 \exp(-105))/10 +$
 $(2^{1/2} \cos(\pi/4 - 35))/10, (88 \exp(-351/5))/5 - (127 \exp(-1053/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 351/10))/10, (88 \exp(-352/5))/5 - (127 \exp(-528/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 176/5))/10, (88 \exp(-353/5))/5 - (127 \exp(-1059/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 353/10))/10, (88 \exp(-354/5))/5 - (127 \exp(-531/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 177/5))/10, (88 \exp(-71))/5 - (127 \exp(-213/2))/10 +$

$(2^{1/2} \cos(\pi/4 - 71/2))/10, (88 \exp(-356/5))/5 - (127 \exp(-534/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 178/5))/10, (88 \exp(-357/5))/5 - (127 \exp(-1071/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 357/10))/10, (88 \exp(-358/5))/5 - (127 \exp(-537/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 179/5))/10, (88 \exp(-359/5))/5 - (127 \exp(-1077/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 359/10))/10, (88 \exp(-72))/5 - (127 \exp(-108))/10 +$
 $(2^{1/2} \cos(\pi/4 - 36))/10, (88 \exp(-361/5))/5 - (127 \exp(-1083/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 361/10))/10, (88 \exp(-362/5))/5 - (127 \exp(-543/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 181/5))/10, (88 \exp(-363/5))/5 - (127 \exp(-1089/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 363/10))/10, (88 \exp(-364/5))/5 - (127 \exp(-546/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 182/5))/10, (88 \exp(-73))/5 - (127 \exp(-219/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 73/2))/10, (88 \exp(-366/5))/5 - (127 \exp(-549/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 183/5))/10, (88 \exp(-367/5))/5 - (127 \exp(-1101/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 367/10))/10, (88 \exp(-368/5))/5 - (127 \exp(-552/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 184/5))/10, (88 \exp(-369/5))/5 - (127 \exp(-1107/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 369/10))/10, (88 \exp(-74))/5 - (127 \exp(-111))/10 +$
 $(2^{1/2} \cos(\pi/4 - 37))/10, (88 \exp(-371/5))/5 - (127 \exp(-1113/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 371/10))/10, (88 \exp(-372/5))/5 - (127 \exp(-558/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 186/5))/10, (88 \exp(-373/5))/5 - (127 \exp(-1119/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 373/10))/10, (88 \exp(-374/5))/5 - (127 \exp(-561/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 187/5))/10, (88 \exp(-75))/5 - (127 \exp(-225/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 75/2))/10, (88 \exp(-376/5))/5 - (127 \exp(-564/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 188/5))/10, (88 \exp(-377/5))/5 - (127 \exp(-1131/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 377/10))/10, (88 \exp(-378/5))/5 - (127 \exp(-567/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 189/5))/10, (88 \exp(-379/5))/5 - (127 \exp(-1137/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 379/10))/10, (88 \exp(-76))/5 - (127 \exp(-114))/10 +$
 $(2^{1/2} \cos(\pi/4 - 38))/10, (88 \exp(-381/5))/5 - (127 \exp(-1143/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 381/10))/10, (88 \exp(-382/5))/5 - (127 \exp(-573/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 191/5))/10, (88 \exp(-383/5))/5 - (127 \exp(-1149/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 383/10))/10, (88 \exp(-384/5))/5 - (127 \exp(-576/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 192/5))/10, (88 \exp(-77))/5 - (127 \exp(-231/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 77/2))/10, (88 \exp(-386/5))/5 - (127 \exp(-579/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 193/5))/10, (88 \exp(-387/5))/5 - (127 \exp(-1161/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 387/10))/10, (88 \exp(-388/5))/5 - (127 \exp(-582/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 194/5))/10, (88 \exp(-389/5))/5 - (127 \exp(-1167/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 389/10))/10, (88 \exp(-78))/5 - (127 \exp(-117))/10 +$
 $(2^{1/2} \cos(\pi/4 - 39))/10, (88 \exp(-391/5))/5 - (127 \exp(-1173/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 391/10))/10, (88 \exp(-392/5))/5 - (127 \exp(-588/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 196/5))/10, (88 \exp(-393/5))/5 - (127 \exp(-1179/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 393/10))/10, (88 \exp(-394/5))/5 - (127 \exp(-591/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 197/5))/10, (88 \exp(-79))/5 - (127 \exp(-237/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 79/2))/10, (88 \exp(-396/5))/5 - (127 \exp(-594/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 198/5))/10, (88 \exp(-397/5))/5 - (127 \exp(-1191/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 397/10))/10, (88 \exp(-398/5))/5 - (127 \exp(-597/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 199/5))/10, (88 \exp(-399/5))/5 - (127 \exp(-1197/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 399/10))/10, (88 \exp(-80))/5 - (127 \exp(-120))/10 +$
 $(2^{1/2} \cos(\pi/4 - 40))/10, (88 \exp(-401/5))/5 - (127 \exp(-1203/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 401/10))/10, (88 \exp(-402/5))/5 - (127 \exp(-603/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 201/5))/10, (88 \exp(-403/5))/5 - (127 \exp(-1209/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 403/10))/10, (88 \exp(-404/5))/5 - (127 \exp(-606/5))/10 +$

$(2^{(1/2)} \cos(\pi/4 - 202/5))/10, (88 \exp(-81))/5 - (127 \exp(-243/2))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 81/2))/10, (88 \exp(-406/5))/5 - (127 \exp(-609/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 203/5))/10, (88 \exp(-407/5))/5 - (127 \exp(-1221/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 407/10))/10, (88 \exp(-408/5))/5 - (127 \exp(-612/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 204/5))/10, (88 \exp(-409/5))/5 - (127 \exp(-1227/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 409/10))/10, (88 \exp(-82))/5 - (127 \exp(-123))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 41))/10, (88 \exp(-411/5))/5 - (127 \exp(-1233/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 411/10))/10, (88 \exp(-412/5))/5 - (127 \exp(-618/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 206/5))/10, (88 \exp(-413/5))/5 - (127 \exp(-1239/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 413/10))/10, (88 \exp(-414/5))/5 - (127 \exp(-621/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 207/5))/10, (88 \exp(-83))/5 - (127 \exp(-249/2))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 83/2))/10, (88 \exp(-416/5))/5 - (127 \exp(-624/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 208/5))/10, (88 \exp(-417/5))/5 - (127 \exp(-1251/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 417/10))/10, (88 \exp(-418/5))/5 - (127 \exp(-627/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 209/5))/10, (88 \exp(-419/5))/5 - (127 \exp(-1257/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 419/10))/10, (88 \exp(-84))/5 - (127 \exp(-126))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 42))/10, (88 \exp(-421/5))/5 - (127 \exp(-1263/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 421/10))/10, (88 \exp(-422/5))/5 - (127 \exp(-633/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 211/5))/10, (88 \exp(-423/5))/5 - (127 \exp(-1269/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 423/10))/10, (88 \exp(-424/5))/5 - (127 \exp(-636/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 212/5))/10, (88 \exp(-85))/5 - (127 \exp(-255/2))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 85/2))/10, (88 \exp(-426/5))/5 - (127 \exp(-639/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 213/5))/10, (88 \exp(-427/5))/5 - (127 \exp(-1281/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 427/10))/10, (88 \exp(-428/5))/5 - (127 \exp(-642/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 214/5))/10, (88 \exp(-429/5))/5 - (127 \exp(-1287/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 429/10))/10, (88 \exp(-86))/5 - (127 \exp(-129))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 43))/10, (88 \exp(-431/5))/5 - (127 \exp(-1293/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 431/10))/10, (88 \exp(-432/5))/5 - (127 \exp(-648/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 216/5))/10, (88 \exp(-433/5))/5 - (127 \exp(-1299/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 433/10))/10, (88 \exp(-434/5))/5 - (127 \exp(-651/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 217/5))/10, (88 \exp(-87))/5 - (127 \exp(-261/2))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 87/2))/10, (88 \exp(-436/5))/5 - (127 \exp(-654/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 218/5))/10, (88 \exp(-437/5))/5 - (127 \exp(-1311/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 437/10))/10, (88 \exp(-438/5))/5 - (127 \exp(-657/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 219/5))/10, (88 \exp(-439/5))/5 - (127 \exp(-1317/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 439/10))/10, (88 \exp(-88))/5 - (127 \exp(-132))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 44))/10, (88 \exp(-441/5))/5 - (127 \exp(-1323/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 441/10))/10, (88 \exp(-442/5))/5 - (127 \exp(-663/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 221/5))/10, (88 \exp(-443/5))/5 - (127 \exp(-1329/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 443/10))/10, (88 \exp(-444/5))/5 - (127 \exp(-666/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 222/5))/10, (88 \exp(-89))/5 - (127 \exp(-267/2))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 89/2))/10, (88 \exp(-446/5))/5 - (127 \exp(-669/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 223/5))/10, (88 \exp(-447/5))/5 - (127 \exp(-1341/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 447/10))/10, (88 \exp(-448/5))/5 - (127 \exp(-672/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 224/5))/10, (88 \exp(-449/5))/5 - (127 \exp(-1347/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 449/10))/10, (88 \exp(-90))/5 - (127 \exp(-135))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 45))/10, (88 \exp(-451/5))/5 - (127 \exp(-1353/10))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 451/10))/10, (88 \exp(-452/5))/5 - (127 \exp(-678/5))/10 +$
 $(2^{(1/2)} \cos(\pi/4 - 226/5))/10, (88 \exp(-453/5))/5 - (127 \exp(-1359/10))/10 +$

$(2^{1/2} \cos(\pi/4 - 453/10))/10, (88 \exp(-454/5))/5 - (127 \exp(-681/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 227/5))/10, (88 \exp(-91))/5 - (127 \exp(-273/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 91/2))/10, (88 \exp(-456/5))/5 - (127 \exp(-684/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 228/5))/10, (88 \exp(-457/5))/5 - (127 \exp(-1371/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 457/10))/10, (88 \exp(-458/5))/5 - (127 \exp(-687/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 229/5))/10, (88 \exp(-459/5))/5 - (127 \exp(-1377/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 459/10))/10, (88 \exp(-92))/5 - (127 \exp(-138))/10 +$
 $(2^{1/2} \cos(\pi/4 - 46))/10, (88 \exp(-461/5))/5 - (127 \exp(-1383/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 461/10))/10, (88 \exp(-462/5))/5 - (127 \exp(-693/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 231/5))/10, (88 \exp(-463/5))/5 - (127 \exp(-1389/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 463/10))/10, (88 \exp(-464/5))/5 - (127 \exp(-696/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 232/5))/10, (88 \exp(-93))/5 - (127 \exp(-279/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 93/2))/10, (88 \exp(-466/5))/5 - (127 \exp(-699/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 233/5))/10, (88 \exp(-467/5))/5 - (127 \exp(-1401/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 467/10))/10, (88 \exp(-468/5))/5 - (127 \exp(-702/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 234/5))/10, (88 \exp(-469/5))/5 - (127 \exp(-1407/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 469/10))/10, (88 \exp(-94))/5 - (127 \exp(-141))/10 +$
 $(2^{1/2} \cos(\pi/4 - 47))/10, (88 \exp(-471/5))/5 - (127 \exp(-1413/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 471/10))/10, (88 \exp(-472/5))/5 - (127 \exp(-708/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 236/5))/10, (88 \exp(-473/5))/5 - (127 \exp(-1419/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 473/10))/10, (88 \exp(-474/5))/5 - (127 \exp(-711/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 237/5))/10, (88 \exp(-95))/5 - (127 \exp(-285/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 95/2))/10, (88 \exp(-476/5))/5 - (127 \exp(-714/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 238/5))/10, (88 \exp(-477/5))/5 - (127 \exp(-1431/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 477/10))/10, (88 \exp(-478/5))/5 - (127 \exp(-717/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 239/5))/10, (88 \exp(-479/5))/5 - (127 \exp(-1437/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 479/10))/10, (88 \exp(-96))/5 - (127 \exp(-144))/10 +$
 $(2^{1/2} \cos(\pi/4 - 48))/10, (88 \exp(-481/5))/5 - (127 \exp(-1443/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 481/10))/10, (88 \exp(-482/5))/5 - (127 \exp(-723/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 241/5))/10, (88 \exp(-483/5))/5 - (127 \exp(-1449/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 483/10))/10, (88 \exp(-484/5))/5 - (127 \exp(-726/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 242/5))/10, (88 \exp(-97))/5 - (127 \exp(-291/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 97/2))/10, (88 \exp(-486/5))/5 - (127 \exp(-729/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 243/5))/10, (88 \exp(-487/5))/5 - (127 \exp(-1461/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 487/10))/10, (88 \exp(-488/5))/5 - (127 \exp(-732/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 244/5))/10, (88 \exp(-489/5))/5 - (127 \exp(-1467/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 489/10))/10, (88 \exp(-98))/5 - (127 \exp(-147))/10 +$
 $(2^{1/2} \cos(\pi/4 - 49))/10, (88 \exp(-491/5))/5 - (127 \exp(-1473/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 491/10))/10, (88 \exp(-492/5))/5 - (127 \exp(-738/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 246/5))/10, (88 \exp(-493/5))/5 - (127 \exp(-1479/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 493/10))/10, (88 \exp(-494/5))/5 - (127 \exp(-741/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 247/5))/10, (88 \exp(-99))/5 - (127 \exp(-297/2))/10 +$
 $(2^{1/2} \cos(\pi/4 - 99/2))/10, (88 \exp(-496/5))/5 - (127 \exp(-744/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 248/5))/10, (88 \exp(-497/5))/5 - (127 \exp(-1491/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 497/10))/10, (88 \exp(-498/5))/5 - (127 \exp(-747/5))/10 +$
 $(2^{1/2} \cos(\pi/4 - 249/5))/10, (88 \exp(-499/5))/5 - (127 \exp(-1497/10))/10 +$
 $(2^{1/2} \cos(\pi/4 - 499/10))/10, (88 \exp(-100))/5 - (127 \exp(-150))/10 +$
 $(2^{1/2} \cos(\pi/4 - 50))/10]$



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Question2

```
commandwindow

clear

clc

close all
syms A1(t) A2(t)
dA2 = diff(A2,t)
dA1 = diff(A1,t)
g = [dA1 + (3*A2) == exp(-2*t) , dA2 - (3*A1) == exp(2*t)]
gcond = [A2(0) == 30 , A1(0) == 30]
d = dsolve(g,gcond)
A2 = d.A2
A1 = d.A1
pretty(A2)
pretty(A1)
tn = [0:0.1:3.5]
f1 = subs(A1,tn)
f2 = subs(A2,tn)
grid on
grid minor
axis tight
xlabel('Time(hour)')
ylabel('Temperature(degree celsius)')
legend('T1(degree celsius)', 'T2(degree celsius)')
figure(1)
plot(tn,f1,tn,f2)
```

answer

dA2(t) =

diff(A2(t), t)

dA1(t) =

```
diff(A1(t), t)
```

```
g(t) =
```

```
[ 3*A2(t) + diff(A1(t), t) == exp(-2*t), diff(A2(t), t) - 3*A1(t) == exp(2*t)]
```

```
gcond =
```

```
[ A2(0) == 30, A1(0) == 30]
```

```
d =
```

```
struct with fields:
```

```
A2: [1x1 sym]
```

```
A1: [1x1 sym]
```

```
A2 =
```

$$(3*\exp(-2*t))/13 + (2*\exp(2*t))/13 + (5*12170^(1/2)*\cos(3*t - \operatorname{atan}(79/77)))/13$$

A1 =

$$(5*12170^(1/2)*\cos(3*t + \operatorname{atan}(77/79)))/13 - (3*\exp(2*t))/13 - (2*\exp(-2*t))/13$$

$$\frac{\exp(-2 t) \sqrt{12170} \cos\left(3 t - \operatorname{atan}\left(\frac{79}{77}\right)\right)}{13} + \frac{\exp(2 t)}{13} + \frac{\sqrt{12170} \cos\left(3 t + \operatorname{atan}\left(\frac{77}{79}\right)\right)}{13}$$

$$\frac{\sqrt{12170} \cos\left(3 t + \operatorname{atan}\left(\frac{77}{79}\right)\right)}{13} - \frac{\exp(2 t)}{13} - \frac{\exp(-2 t)}{13}$$

tn =

Columns 1 through 7

0	0.1000	0.2000	0.3000	0.4000	0.5000	0.6000
---	--------	--------	--------	--------	--------	--------

Columns 8 through 14

0.7000	0.8000	0.9000	1.0000	1.1000	1.2000	1.3000
--------	--------	--------	--------	--------	--------	--------

Columns 15 through 21

1.4000	1.5000	1.6000	1.7000	1.8000	1.9000	2.0000
--------	--------	--------	--------	--------	--------	--------

Columns 22 through 28

2.1000	2.2000	2.3000	2.4000	2.5000	2.6000	2.7000
--------	--------	--------	--------	--------	--------	--------

Columns 29 through 35

2.8000	2.9000	3.0000	3.1000	3.2000	3.3000	3.4000
--------	--------	--------	--------	--------	--------	--------

Column 36

3.5000

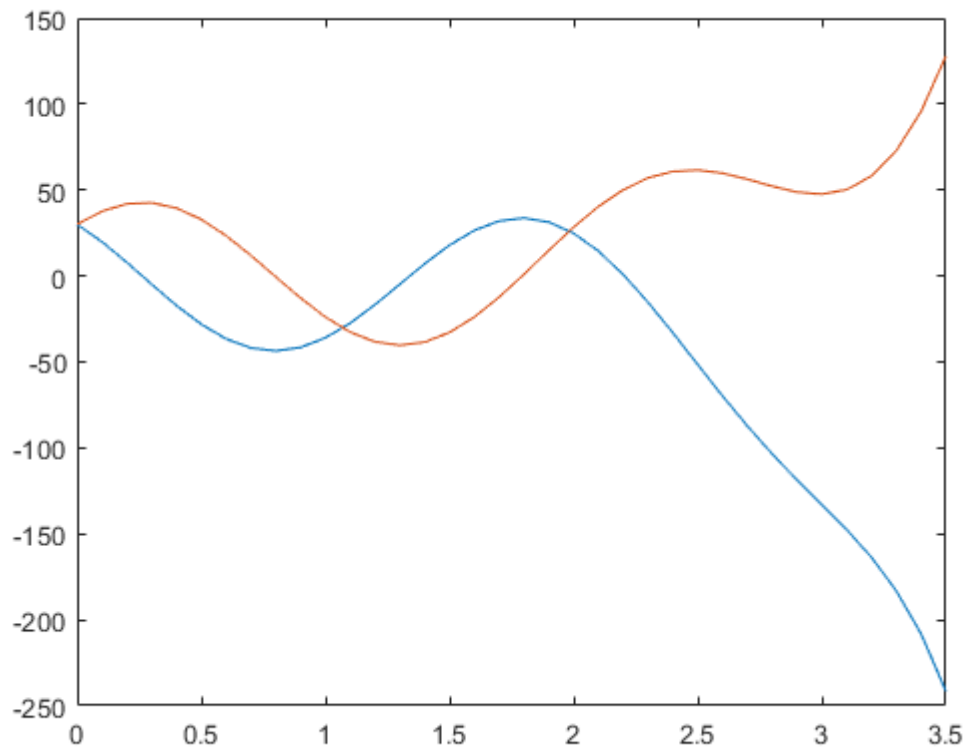
f1 =

```
[ 30, (5*12170^(1/2)*cos(atan(77/79) + 3/10))/13 - (3*exp(1/5))/13 - (2*exp(-
1/5))/13, (5*12170^(1/2)*cos(atan(77/79) + 3/5))/13 - (3*exp(2/5))/13 - (2*exp(-
2/5))/13, (5*12170^(1/2)*cos(atan(77/79) + 9/10))/13 - (3*exp(3/5))/13 - (2*exp(-
3/5))/13, (5*12170^(1/2)*cos(atan(77/79) + 6/5))/13 - (3*exp(4/5))/13 - (2*exp(-
4/5))/13, (5*12170^(1/2)*cos(atan(77/79) + 3/2))/13 - (3*exp(1))/13 - (2*exp(-
1))/13, (5*12170^(1/2)*cos(atan(77/79) + 9/5))/13 - (3*exp(6/5))/13 - (2*exp(-
6/5))/13, (5*12170^(1/2)*cos(atan(77/79) + 21/10))/13 - (3*exp(7/5))/13 - (2*exp(-
7/5))/13, (5*12170^(1/2)*cos(atan(77/79) + 12/5))/13 - (3*exp(8/5))/13 - (2*exp(-
8/5))/13, (5*12170^(1/2)*cos(atan(77/79) + 27/10))/13 - (3*exp(9/5))/13 - (2*exp(-
9/5))/13, (5*12170^(1/2)*cos(atan(77/79) + 3))/13 - (3*exp(2))/13 - (2*exp(-2))/13,
(5*12170^(1/2)*cos(atan(77/79) + 33/10))/13 - (3*exp(11/5))/13 - (2*exp(-11/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 18/5))/13 - (3*exp(12/5))/13 - (2*exp(-12/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 39/10))/13 - (3*exp(13/5))/13 - (2*exp(-13/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 21/5))/13 - (3*exp(14/5))/13 - (2*exp(-14/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 9/2))/13 - (3*exp(3))/13 - (2*exp(-3))/13,
(5*12170^(1/2)*cos(atan(77/79) + 24/5))/13 - (3*exp(16/5))/13 - (2*exp(-16/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 51/10))/13 - (3*exp(17/5))/13 - (2*exp(-17/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 27/5))/13 - (3*exp(18/5))/13 - (2*exp(-18/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 57/10))/13 - (3*exp(19/5))/13 - (2*exp(-19/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 6))/13 - (3*exp(4))/13 - (2*exp(-4))/13,
(5*12170^(1/2)*cos(atan(77/79) + 63/10))/13 - (3*exp(21/5))/13 - (2*exp(-21/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 33/5))/13 - (3*exp(22/5))/13 - (2*exp(-22/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 69/10))/13 - (3*exp(23/5))/13 - (2*exp(-23/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 36/5))/13 - (3*exp(24/5))/13 - (2*exp(-24/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 15/2))/13 - (3*exp(5))/13 - (2*exp(-5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 39/5))/13 - (3*exp(26/5))/13 - (2*exp(-26/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 81/10))/13 - (3*exp(27/5))/13 - (2*exp(-27/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 42/5))/13 - (3*exp(28/5))/13 - (2*exp(-28/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 87/10))/13 - (3*exp(29/5))/13 - (2*exp(-29/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 9))/13 - (3*exp(6))/13 - (2*exp(-6))/13,
(5*12170^(1/2)*cos(atan(77/79) + 93/10))/13 - (3*exp(31/5))/13 - (2*exp(-31/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 48/5))/13 - (3*exp(32/5))/13 - (2*exp(-32/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 99/10))/13 - (3*exp(33/5))/13 - (2*exp(-33/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 51/5))/13 - (3*exp(34/5))/13 - (2*exp(-34/5))/13,
(5*12170^(1/2)*cos(atan(77/79) + 21/2))/13 - (3*exp(7))/13 - (2*exp(-7))/13]
```


f2 =

```
[ 30, (3*exp(-1/5))/13 + (2*exp(1/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
3/10))/13, (3*exp(-2/5))/13 + (2*exp(2/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
3/5))/13, (3*exp(-3/5))/13 + (2*exp(3/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
9/10))/13, (3*exp(-4/5))/13 + (2*exp(4/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
6/5))/13, (3*exp(-1))/13 + (2*exp(1))/13 + (5*12170^(1/2)*cos(atan(79/77) -
3/2))/13, (3*exp(-6/5))/13 + (2*exp(6/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
9/5))/13, (3*exp(-7/5))/13 + (2*exp(7/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
21/10))/13, (3*exp(-8/5))/13 + (2*exp(8/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
12/5))/13, (3*exp(-9/5))/13 + (2*exp(9/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
27/10))/13, (3*exp(-2))/13 + (2*exp(2))/13 + (5*12170^(1/2)*cos(atan(79/77) -
3))/13, (3*exp(-11/5))/13 + (2*exp(11/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
33/10))/13, (3*exp(-12/5))/13 + (2*exp(12/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
18/5))/13, (3*exp(-13/5))/13 + (2*exp(13/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
39/10))/13, (3*exp(-14/5))/13 + (2*exp(14/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
21/5))/13, (3*exp(-3))/13 + (2*exp(3))/13 + (5*12170^(1/2)*cos(atan(79/77) -
9/2))/13, (3*exp(-16/5))/13 + (2*exp(16/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
24/5))/13, (3*exp(-17/5))/13 + (2*exp(17/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
51/10))/13, (3*exp(-18/5))/13 + (2*exp(18/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
27/5))/13, (3*exp(-19/5))/13 + (2*exp(19/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
57/10))/13, (3*exp(-4))/13 + (2*exp(4))/13 + (5*12170^(1/2)*cos(atan(79/77) -
6))/13, (3*exp(-21/5))/13 + (2*exp(21/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
63/10))/13, (3*exp(-22/5))/13 + (2*exp(22/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
33/5))/13, (3*exp(-23/5))/13 + (2*exp(23/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
69/10))/13, (3*exp(-24/5))/13 + (2*exp(24/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
36/5))/13, (3*exp(-5))/13 + (2*exp(5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
15/2))/13, (3*exp(-26/5))/13 + (2*exp(26/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
39/5))/13, (3*exp(-27/5))/13 + (2*exp(27/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
81/10))/13, (3*exp(-28/5))/13 + (2*exp(28/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
42/5))/13, (3*exp(-29/5))/13 + (2*exp(29/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
87/10))/13, (3*exp(-6))/13 + (2*exp(6))/13 + (5*12170^(1/2)*cos(atan(79/77) -
9))/13, (3*exp(-31/5))/13 + (2*exp(31/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
93/10))/13, (3*exp(-32/5))/13 + (2*exp(32/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
48/5))/13, (3*exp(-33/5))/13 + (2*exp(33/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
99/10))/13, (3*exp(-34/5))/13 + (2*exp(34/5))/13 + (5*12170^(1/2)*cos(atan(79/77) -
51/5))/13, (3*exp(-7))/13 + (2*exp(7))/13 + (5*12170^(1/2)*cos(atan(79/77) -
21/2))/13]
```

Warning: Ignoring extra legend entries.



Question3

```
commandwindow

clear

clc

syms I(t) L R E
eva = [diff(I,t)*L + R*I == E]
evacond = [I(0) == 0 ]
elah = dsolve(eva,evacond)
pretty(elah)
```

answer

eva(t) =

$L \cdot \text{diff}(I(t), t) + R \cdot I(t) == E$

evacond =

$I(0) == 0$

elah =

$(E - E \cdot \exp(-(R \cdot t)/L))/R$

$/ R t \backslash$

$$E = E \exp\left\{ - \frac{L}{R} \right\}$$

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Question 4

```

commandwindow

clear

clc

syms t w a k
eva = k*exp(-a*t)*cos(w*t)
elah= laplace(eva)
pretty(elah)

```

answer

eva =

$k \exp(-a t) \cos(t w)$

elah =

$(k*(a + s))/((a + s)^2 + w^2)$

k (a + s)

2 2

(a + s) + w

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Question5

```
commandwindow
```

```
clear
```

```
clc
```

```
syms s pi
```

```
ekaesor = pi/(s^2+(10*pi*s)+(24*pi^2))
```

```
nelson = ilaplace(ekaesor)
```

```
pretty(nelson)
```

```
answer
```

ekaesor =

$$\pi/(s^2 + 10\pi s + 24\pi^2)$$

nelson =

$$\exp(-4\pi t)/2 - \exp(-6\pi t)/2$$

$$\exp(-4 \pi t) \quad \exp(-6 \pi t)$$

----- - -----

2

2