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```
commandwindow
clear
clc
close all
syms t
v(t)=110*cos(120*pi*t)
i=diff(v)
p=diff(i)
t=0:0.01:0.35
vn=subs(v)
vnn=double(vn)
in=subs(i)
inn=double(in)
pn=subs(p)
pnn=double(pn)
plot(t,vnn)
hold on
plot(t,inn)
hold on
plot(t,pnn)
xlabel('time(secs)')
ylabel('variable')zx
legend('voltage(v)', 'current(i)', 'power(w)')
grid on
grid minor
```

v(t) =

$$110 \cdot \cos(120 \cdot \pi \cdot t)$$

i(t) =

$$-13200 \cdot \pi \cdot \sin(120 \cdot \pi \cdot t)$$

p(t) =

$$-1584000 \cdot \pi^2 \cdot \cos(120 \cdot \pi \cdot t)$$

t =

Columns 1 through 12

	0	0.0100	0.0200	0.0300	0.0400	0.0500	0.0600
0.0700	0.0800	0.0900	0.1000	0.1100			

Columns 13 through 24

0.1200	0.1300	0.1400	0.1500	0.1600	0.1700	0.1800
0.1900	0.2000	0.2100	0.2200	0.2300		

Columns 25 through 36

0.2400	0.2500	0.2600	0.2700	0.2800	0.2900	0.3000
0.3100	0.3200	0.3300	0.3400	0.3500		

vn(t) =

```
[ 110, - (55*5^(1/2))/2 - 55/2, (55*5^(1/2))/2 - 55/2, (55*5^(1/2))/2 -
55/2, - (55*5^(1/2))/2 - 55/2, 110, - (55*5^(1/2))/2 - 55/2,
(55*5^(1/2))/2 - 55/2, (55*5^(1/2))/2 - 55/2, - (55*5^(1/2))/2 - 55/2,
110, - (55*5^(1/2))/2 - 55/2, (55*5^(1/2))/2 - 55/2, (55*5^(1/2))/2 -
55/2, - (55*5^(1/2))/2 - 55/2, 110, - (55*5^(1/2))/2 - 55/2,
(55*5^(1/2))/2 - 55/2, (55*5^(1/2))/2 - 55/2, - (55*5^(1/2))/2 - 55/2,
110, - (55*5^(1/2))/2 - 55/2, (55*5^(1/2))/2 - 55/2, (55*5^(1/2))/2 -
55/2, - (55*5^(1/2))/2 - 55/2, 110, - (55*5^(1/2))/2 - 55/2,
(55*5^(1/2))/2 - 55/2, (55*5^(1/2))/2 - 55/2, - (55*5^(1/2))/2 - 55/2,
110, - (55*5^(1/2))/2 - 55/2, (55*5^(1/2))/2 - 55/2, (55*5^(1/2))/2 -
55/2, - (55*5^(1/2))/2 - 55/2, 110]
```

vnn =

Columns 1 through 12

110.0000	-88.9919	33.9919	33.9919	-88.9919	110.0000	-88.9919
33.9919	33.9919	-88.9919	110.0000	-88.9919		

Columns 13 through 24

33.9919	33.9919	-88.9919	110.0000	-88.9919	33.9919	33.9919	-
88.9919	110.0000	-88.9919	33.9919	33.9919			

Columns 25 through 36

-88.9919	110.0000	-88.9919	33.9919	33.9919	-88.9919	110.0000	-
88.9919	33.9919	33.9919	-88.9919	110.0000			

in(t) =

```
[ 0, 3300*2^(1/2)*pi*(5 - 5^(1/2))^(1/2), -3300*pi*2^(1/2)*(5^(1/2) +
5)^(1/2), 3300*pi*2^(1/2)*(5^(1/2) + 5)^(1/2), -3300*2^(1/2)*pi*(5 -
5^(1/2))^(1/2), 0, 3300*2^(1/2)*pi*(5 - 5^(1/2))^(1/2), -
3300*pi*2^(1/2)*(5^(1/2) + 5)^(1/2), 3300*pi*2^(1/2)*(5^(1/2) + 5)^(1/2),
-3300*2^(1/2)*pi*(5 - 5^(1/2))^(1/2), 0, 3300*2^(1/2)*pi*(5 -
5^(1/2))^(1/2), -3300*pi*2^(1/2)*(5^(1/2) + 5)^(1/2),
3300*pi*2^(1/2)*(5^(1/2) + 5)^(1/2), -3300*2^(1/2)*pi*(5 -
5^(1/2))^(1/2), 0, 3300*2^(1/2)*pi*(5 - 5^(1/2))^(1/2), -
3300*pi*2^(1/2)*(5^(1/2) + 5)^(1/2), 3300*pi*2^(1/2)*(5^(1/2) + 5)^(1/2),
-3300*2^(1/2)*pi*(5 - 5^(1/2))^(1/2), 0, 3300*2^(1/2)*pi*(5 -
5^(1/2))^(1/2), -3300*pi*2^(1/2)*(5^(1/2) + 5)^(1/2),
3300*pi*2^(1/2)*(5^(1/2) + 5)^(1/2), -3300*2^(1/2)*pi*(5 -
5^(1/2))^(1/2), 0, 3300*2^(1/2)*pi*(5 - 5^(1/2))^(1/2), -
3300*pi*2^(1/2)*(5^(1/2) + 5)^(1/2), 3300*pi*2^(1/2)*(5^(1/2) + 5)^(1/2),
```

```
-3300*2^(1/2)*pi*(5 - 5^(1/2))^(1/2), 0, 3300*2^(1/2)*pi*(5 -
5^(1/2))^(1/2), -3300*pi*2^(1/2)*(5^(1/2) + 5)^(1/2),
3300*pi*2^(1/2)*(5^(1/2) + 5)^(1/2), -3300*2^(1/2)*pi*(5 -
5^(1/2))^(1/2), 0]
```

inn =

1.0e+04 *

Columns 1 through 12

```
      0      2.4375     -3.9439      3.9439     -2.4375      0      2.4375
-3.9439     3.9439     -2.4375      0      2.4375
```

Columns 13 through 24

```
     -3.9439     3.9439     -2.4375      0      2.4375     -3.9439     3.9439
-2.4375      0      2.4375     -3.9439     3.9439
```

Columns 25 through 36

```
     -2.4375      0      2.4375     -3.9439     3.9439     -2.4375      0
2.4375     -3.9439     3.9439     -2.4375      0
```

pn(t) =

```
[ -1584000*pi^2, 1584000*pi^2*(5^(1/2)/4 + 1/4), -1584000*pi^2*(5^(1/2)/4
- 1/4), -1584000*pi^2*(5^(1/2)/4 - 1/4), 1584000*pi^2*(5^(1/2)/4 + 1/4),
-1584000*pi^2, 1584000*pi^2*(5^(1/2)/4 + 1/4), -1584000*pi^2*(5^(1/2)/4 -
1/4), -1584000*pi^2*(5^(1/2)/4 - 1/4), 1584000*pi^2*(5^(1/2)/4 + 1/4), -
1584000*pi^2, 1584000*pi^2*(5^(1/2)/4 + 1/4), -1584000*pi^2*(5^(1/2)/4 -
1/4), -1584000*pi^2*(5^(1/2)/4 - 1/4), 1584000*pi^2*(5^(1/2)/4 + 1/4), -
1584000*pi^2, 1584000*pi^2*(5^(1/2)/4 + 1/4), -1584000*pi^2*(5^(1/2)/4 -
1/4), -1584000*pi^2*(5^(1/2)/4 - 1/4), 1584000*pi^2*(5^(1/2)/4 + 1/4), -
1584000*pi^2, 1584000*pi^2*(5^(1/2)/4 + 1/4), -1584000*pi^2*(5^(1/2)/4 -
1/4), -1584000*pi^2*(5^(1/2)/4 - 1/4), 1584000*pi^2*(5^(1/2)/4 + 1/4), -
1584000*pi^2, 1584000*pi^2*(5^(1/2)/4 + 1/4), -1584000*pi^2*(5^(1/2)/4 -
1/4), -1584000*pi^2*(5^(1/2)/4 - 1/4), 1584000*pi^2*(5^(1/2)/4 + 1/4), -
1584000*pi^2]
```

pnn =

1.0e+07 *

Columns 1 through 12

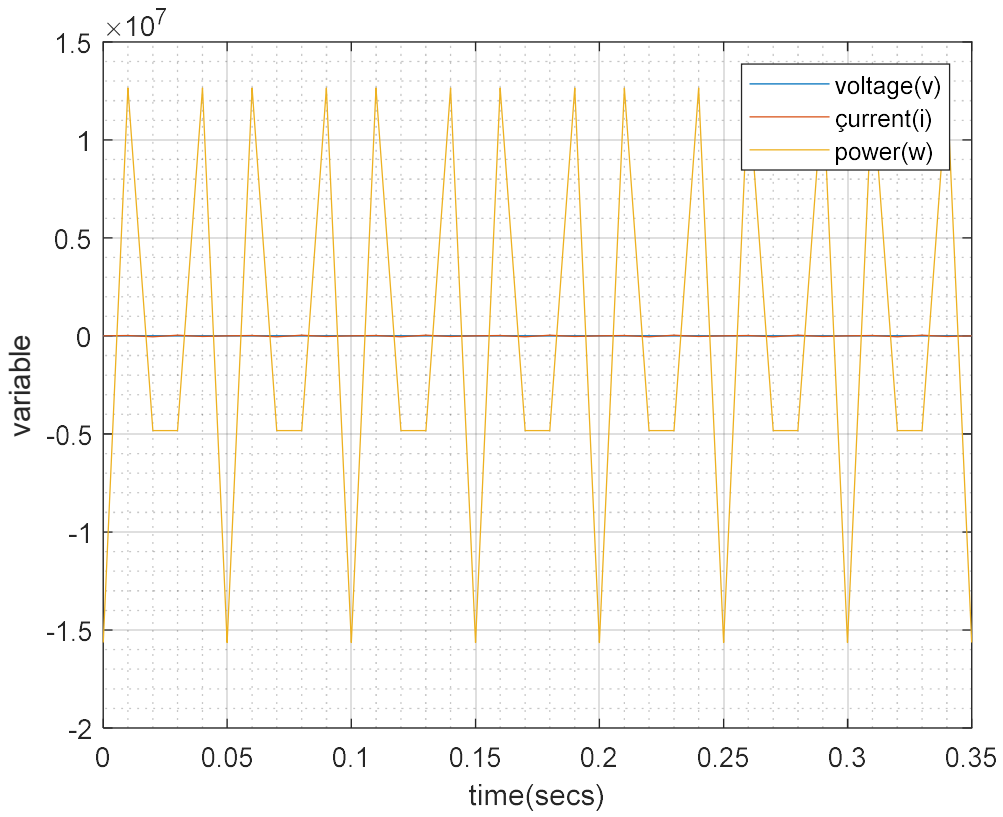
```
     -1.5633     1.2648     -0.4831     -0.4831     1.2648     -1.5633     1.2648
-0.4831     -0.4831     1.2648     -1.5633     1.2648
```

Columns 13 through 24

```
     -0.4831     -0.4831     1.2648     -1.5633     1.2648     -0.4831     -0.4831
1.2648     -1.5633     1.2648     -0.4831     -0.4831
```

Columns 25 through 36

1.2648	-1.5633	1.2648	-0.4831	-0.4831	1.2648	-1.5633
1.2648	-0.4831	-0.4831	1.2648	-1.5633		



:The graph is unstable because the negative values are too high.