

Question 1

```
1 Commandwindow
2 clear
3 clc
4 close all
5 syms t
6  $v(t) = 100 * \cos(120 * \pi * t)$ 
7  $i = \text{diff}(v)$ 
8  $p = \text{diff}(i)$ 
9  $t = 0:0.01:0.35$ 
10  $v_n = \text{subs}(v)$ 
11  $v_{nn} = \text{double}(v_n)$ 
12  $i_n = \text{subs}(i)$ 
13  $i_{nn} = \text{double}(i_n)$ 
14  $p_n = \text{subs}(p)$ 
15  $p_{nn} = \text{double}(p_n)$ 
16  $\text{plot}(t, v_{nn})$ 
17 hold on
18  $\text{plot}(t, i_{nn})$ 
19 hold on
20  $\text{plot}(t, p_{nn})$ 
21  $\text{legend}('voltage (v)', 'current (i)', 'power (w)')$ 
22 grid on
23 grid minor
```