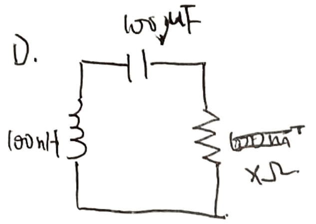
Han yibei 5937058(WPI)

1).



$R = \sqrt{\frac{4L}{C}} = \frac{\sqrt{10}}{50}\Omega$

$i(t) = (C_1 + C_2 t)\cdot e^{-\tau t}$ $\tau = -10^5\cdot\sqrt{10}$

$i_0 = 0$ $i'_0 = 10^{10}$ $\Rightarrow C_1 = 0$ $C_2 = -10^{10}$

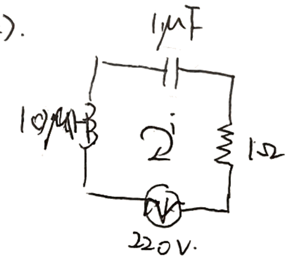
$\Rightarrow i = -10^{10}\cdot t\cdot e^{-\sqrt{10}\cdot 10^5 t}$

$V_R = i\cdot R = -\frac{\sqrt{10}}{5}\times 10^9\cdot t\cdot e^{-10^5\sqrt{10}}$

$P_R = i\cdot V_R = \frac{\sqrt{10}}{5}\times 10^{19}\cdot t^2\cdot e^{-2\sqrt{10}\cdot 10^5 t}$

$P_R' = 4\times 10^{18}\sqrt{10}\, e^{-2\times 10^5\sqrt{10}t} - 4\times 10^{24}\sqrt{10}\cdot e^{-2\times 10^5\sqrt{10}t}$

2).



$X_L = \omega L = 10^{-5}\omega$ $X_C = \frac{1}{10^{-6}\omega} = 10^6\frac{1}{\omega}$

$Z = \sqrt{1 + (\frac{10^6}{\omega} + 10^{-5}\omega)^2} = \sqrt{1 + \frac{10^{22} + 2\times 10^{11} + 1}{10^{10}\omega^2}}$

$I = \frac{220}{Z}$, when $\omega = 10^5\sqrt{10}$, $I_{max} = 220A$.

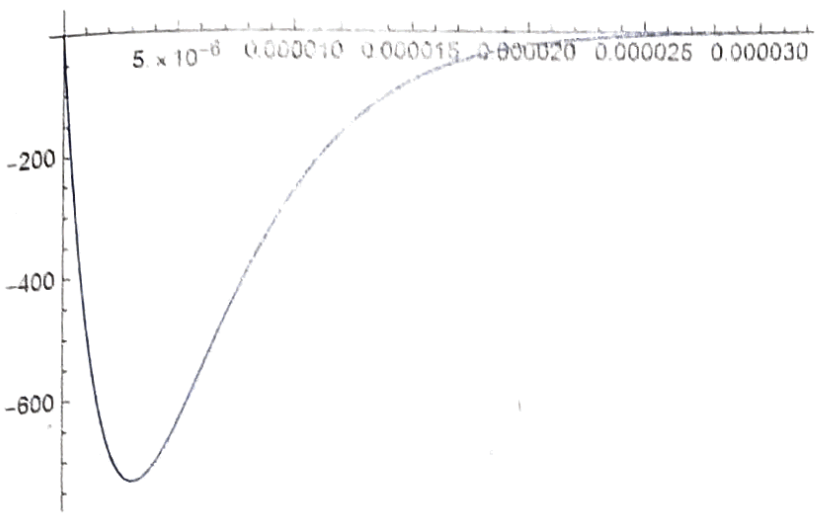
$= \frac{220}{\sqrt{1 + (\frac{10^6}{\omega} - 10^{-5}\omega)^2}}$

$V_C = iX_C = \frac{220\times 10^6}{\omega\sqrt{1 + (\frac{10^6}{\omega} - 10^{-5}\omega)^2}}$

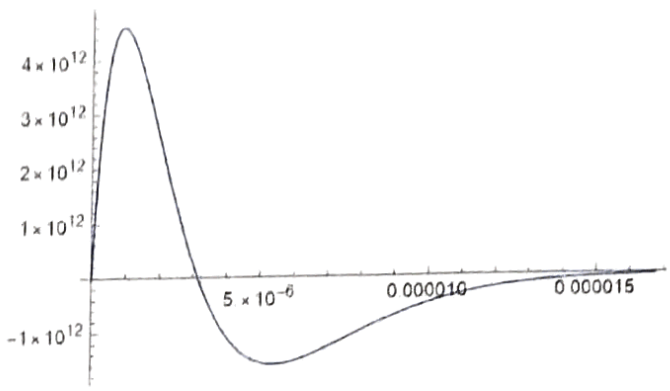
$V_L = iX_L = \frac{220\times 10^{-5}\omega}{\sqrt{1 + (\frac{10^6}{\omega} - 10^{-5}\omega)^2}}$

$P_R = I^2 R = \frac{48400}{1 + (\frac{10^6}{\omega} - 10^{-5}\omega)^2}$

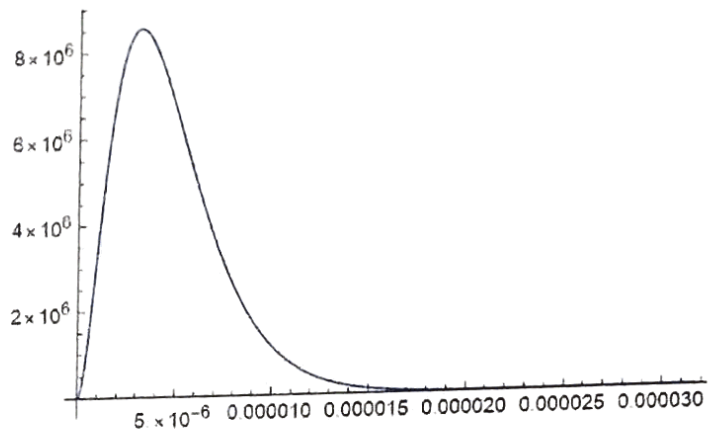
```
i = -10^(10) t*E^(-10^5*Sqrt[10] t); r = Sqrt[10] /50;

v = i*R;
p = v*i;

Plot[v, {t, 0, 10/10^(5.5)}]
```




```
q = D[p, t];

Plot[q, {t, 0, 5.3/10^(5.5)}]
```

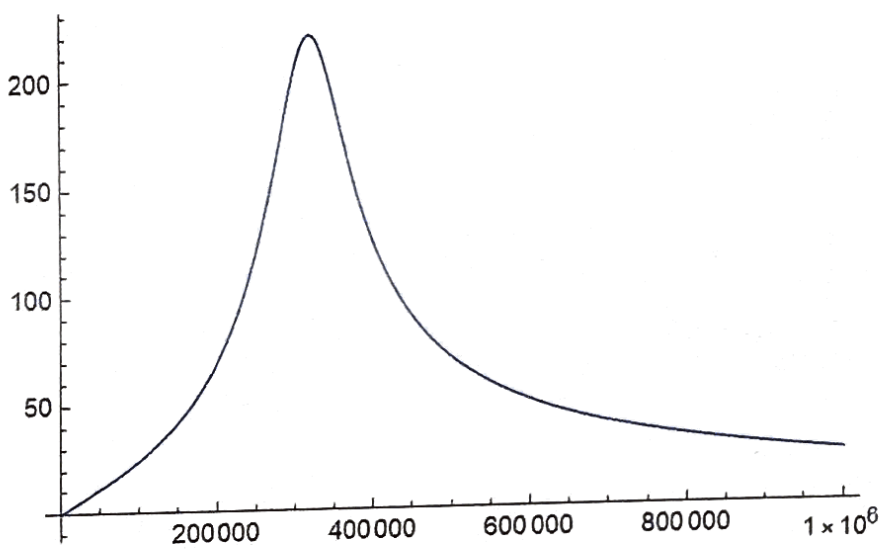



```
Plot[p, {t, 0, 10/10^(5.5)}]
```

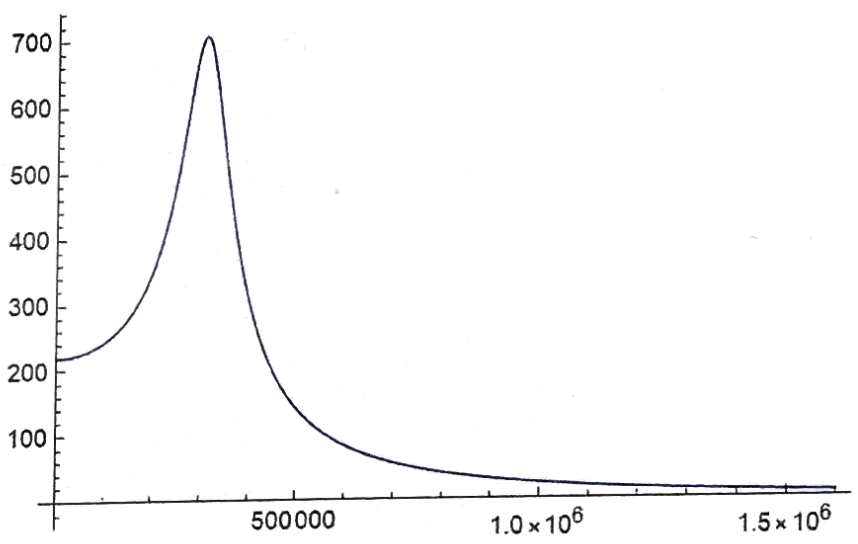


$$i = \frac{220}{\sqrt{1 + (10^6/w - w/10^5)^2}};$$

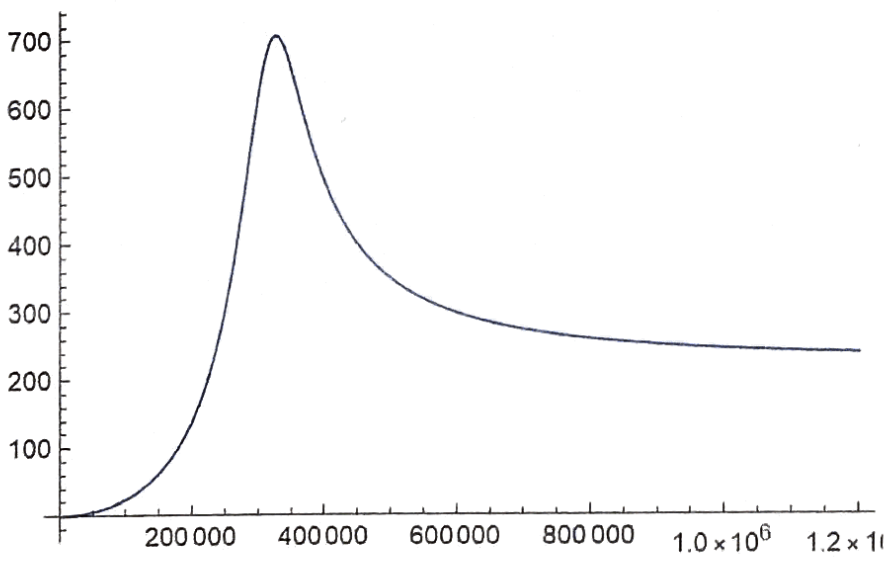
```
Plot[i, {w, 0, 1000000}]
```




```
vc = i*10^6/w;
Plot[vc, {w, 0, 1600000}]
```




```
vl = i*10^-5*w;
Plot[vl, {w, 0, 1200000}]
```




```
r = i^2*1;
Plot[r, {w, 0, 800000}]
```