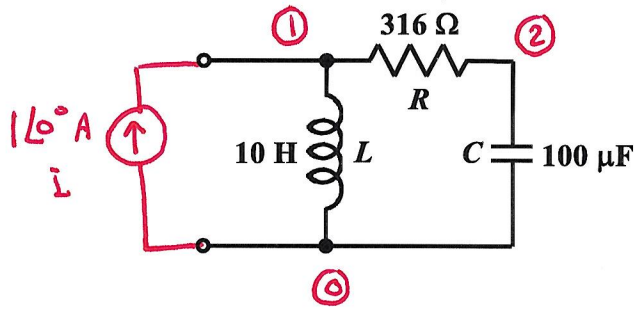


EE 3340
Homework Problem #028

Use LTspice to verify that this circuit has a resonance frequency of $\omega_R = \frac{1}{\sqrt{LC - R^2C^2}}$ rad/s.



$$\omega_R \stackrel{?}{=} \frac{1}{\sqrt{(10)(100 \times 10^{-6}) - (316)^2(100 \times 10^{-6})^2}} \approx 833 \text{ rad/s}$$

$$\text{or } f_R \stackrel{?}{=} \frac{\omega_R}{2\pi} = \frac{833}{2\pi} \approx 133 \text{ Hz}$$

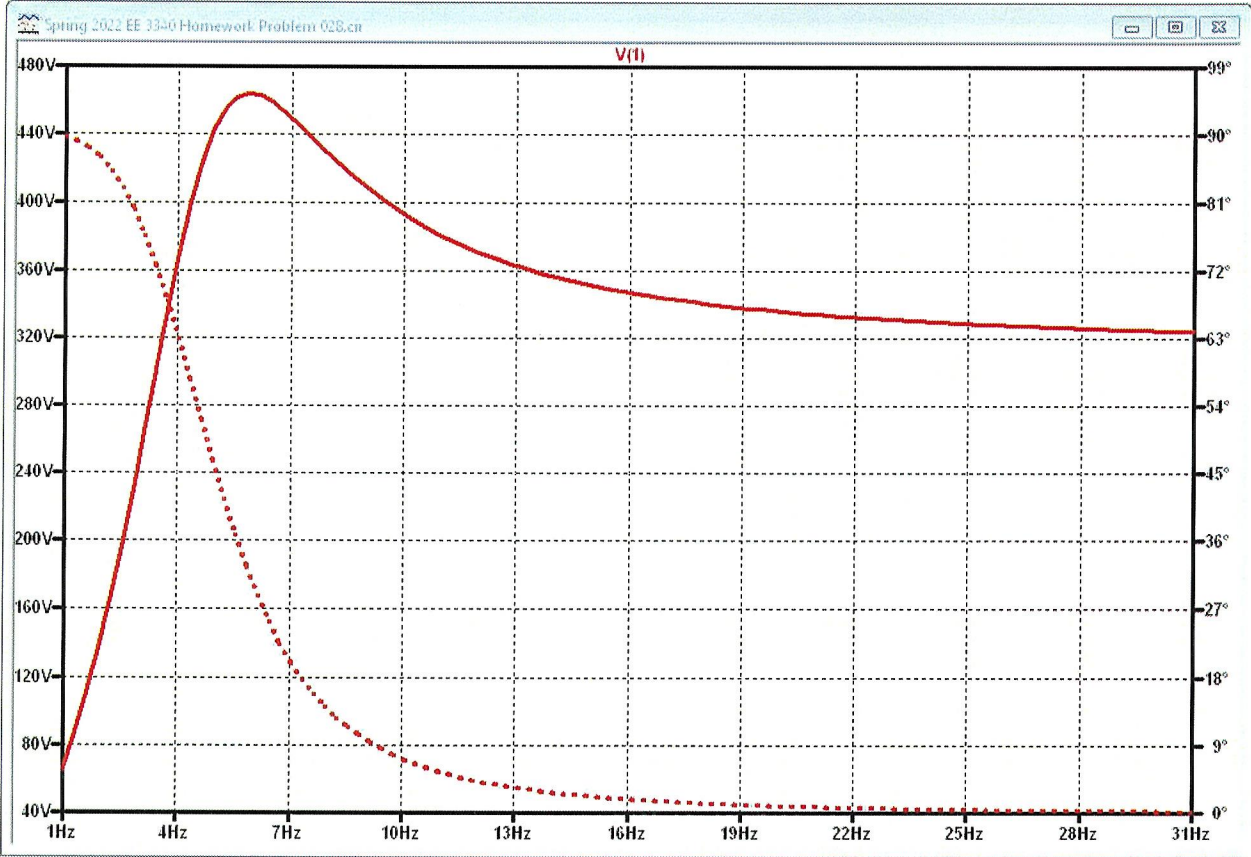
See the attached pages.

The circuit's input impedance is essentially real for any $f > 100 \text{ Hz}$, and has magnitude

$$|Z_{in}| \approx R = 316 \Omega.$$

There really is no single frequency of resonance.

```
Spring 2022 EE 3340 Homework Problem 028.cir
* Q:\EE 3340\homework\Spring 2022 EE 3340 Problem 028.cir
I 0 1 AC 1 0
L 1 0 10
R 1 2 316
C 2 0 100u
.AC lin 100 1 31
.end
```



```
Spring 2022 EE 3340 Homework Problem 028.cir
* Q:\EE 3340\homework\Spring 2022 EE 3340 Problem 028.cir
I 0 1 AC 1 0
L 1 0 10
R 1 2 316
C 2 0 100u
.AC dec 100 1 1000
.end
```

