Frequency Response

Prelab 10

Ben Bunce

1.

$$H(jw) = \frac{jw\frac{1}{RC}}{(jw)^2 + jw\frac{1}{RC} + \frac{1}{LC}} \rightarrow$$

$$H(jw) = \frac{jw\frac{1}{RC}}{-w^2 + jw\frac{1}{RC} + \frac{1}{LC}} \rightarrow$$

$$H(jw) = \frac{jw\frac{1}{RC}}{\left(\frac{1}{LC} - w^2\right) + \left(\frac{jw}{LC}\right)} \rightarrow$$

$$H(jw) = \frac{\frac{w}{RC} \angle 90°}{\sqrt{\left(\frac{1}{LC} - w^2\right)^2 + \left(\frac{jw}{LC}\right)^2} \angle \left(90° - tan^{-1}\left(\frac{w/RC}{1/LC - w^2}\right)\right)} \rightarrow$$

$$\boldsymbol{H(jw) = \frac{\frac{w}{RC}}{\sqrt{\left(\frac{1}{LC} - w^2\right)^2 + \left(\frac{w}{RC}\right)^2}} \angle \left(90° - tan^{-1}\left(\frac{\frac{w}{RC}}{\left(\frac{1}{LC} - w^2\right)}\right)\right)°}$$