Post Lab 07.

Frequency	V_{out} (V_{rms})	Phase
3.4 HZ	30.7mV	85°
34 HZ	294.4 mV	82.3°
340 HZ	2.09 V	42°
3.4 KHZ	2.95V	0°
34 KHZ	2.05V	−49°
340 KHZ	267.4mV	−113.9°

$V_{in} = 3\ V_{rms}$ $\qquad d\beta = 20 \log \frac{V_{out}}{V_{in}}$

$$d\beta = 20 \log_{10} \frac{30.7}{3} \times 10^{-3} = -39.79$$

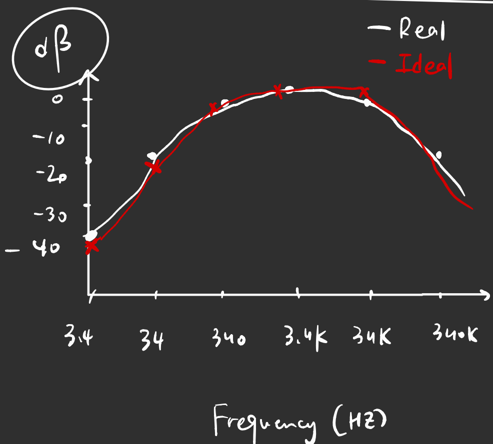
$$d\beta = 20 \log_{10} \frac{294.4}{3} \times 10^{-3} = -20.16$$

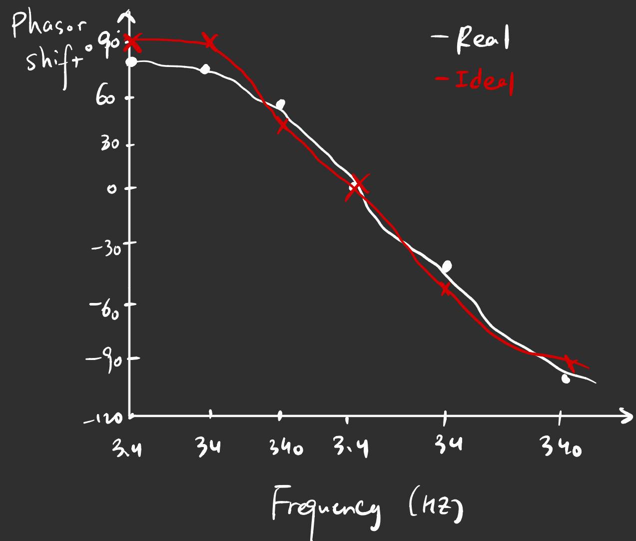
$$d\beta = 20 \log_{10} \frac{2.09}{3} = -3.13$$

$$d\beta = 20 \log_{10} \frac{2.95}{3} = -0.146$$

$$d\beta = 20 \log_{10} \frac{2.05}{3} = -3.3$$

$$d\beta = 20 \log_{10} \frac{267.4}{3} \times 10^{-3} = -20.99$$





Explain: No matter the resistor, capacitor, or op-amp, they are all non-ideal circuit component. therefore, the result will always having some error.

Extra Credit: Even through the function generator was initially set to output 3 V_{rms}, once the filter is connected, its impedance interacts with finite output impedance of the function generator, which reduce the voltage that actually appears at Ch1. Importantly, this drop is not due to the scope's bandwidth or any parastic effect. — it's solely because the filter's input impedance combined with the generator's output impedance, divides the voltage. causing the measured value on Ch1 to be less than 3V_{rms}