

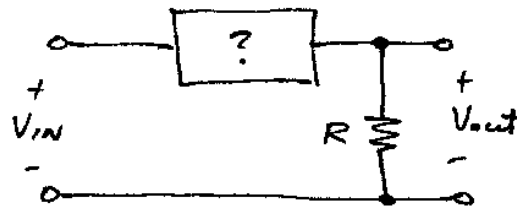
- ① (a) An 8-bit digital-to-analog converter has a typical SNR (signal-to-noise ratio) of 45dB. If the signal power is 500 mW, what is the noise power in mW?

$$45 = \text{SNR} = 10 \log_{10} \left(\frac{P_{\text{SIG}}}{P_{\text{NOISE}}} \right)$$

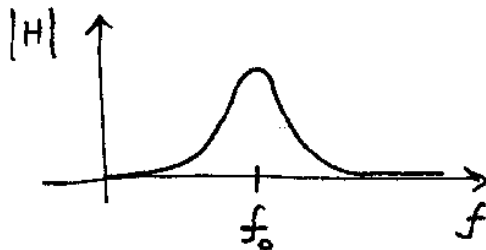
$$10^{\left(\frac{45}{10}\right)} = \frac{P_{\text{SIG}}}{P_{\text{NOISE}}}$$

$$P_{\text{NOISE}} = \frac{P_{\text{SIG}}}{10^{4.5}} = \frac{500 \text{ mW}}{31.6 \text{ E}3} = \boxed{0.0158 \text{ mW}}$$

(b) *Circuit :



* Desired magnitude response:



* What circuit element (series LC, or parallel LC) should you use in the "?" box to achieve the desired magnitude response? Explain your reasoning.

Need the circuit element to look like a short at f_0 (maximizes V_{out}), so use series LC.