

Problem set 1 Question 2

from Question 1 we know

$$\omega = \frac{1}{\sqrt{(L_1+L_2)C}} \Rightarrow 2\pi f = \frac{1}{\sqrt{(L_1+L_2)C}}$$

$$\Rightarrow \frac{1}{\sqrt{2\pi} \cdot 1 \times 10^{-3}} = 20 \times 10^3 \cdot 2\pi$$

$$\sqrt{2L} = \frac{1 \times 10^{-3}}{20 \times 10^3 \times 2\pi}$$

$$2L = \left(\frac{1}{40\pi}\right)^2$$

$$L = 3.16 \times 10^{-5} = 0.0316 \text{ mH}$$

$$\frac{L_1}{L_1+L_2} = \frac{g_0+G}{g_m+g_0+G}$$

$$\frac{1}{2} = \frac{1}{g_m+1} \quad g_m = 1 \times 10^{-3} \text{ S}$$