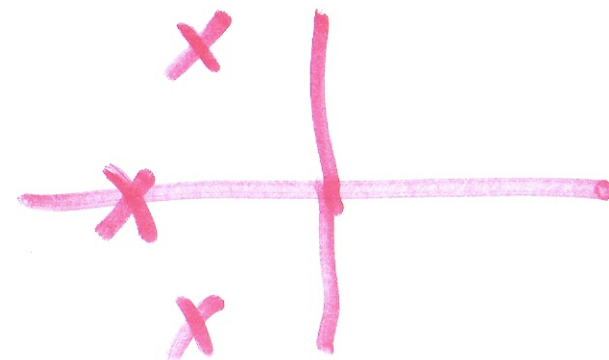
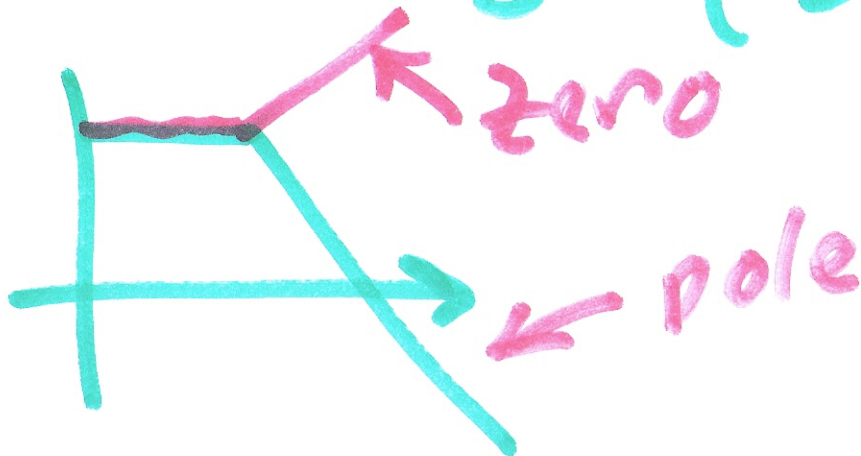


## Lecture 24

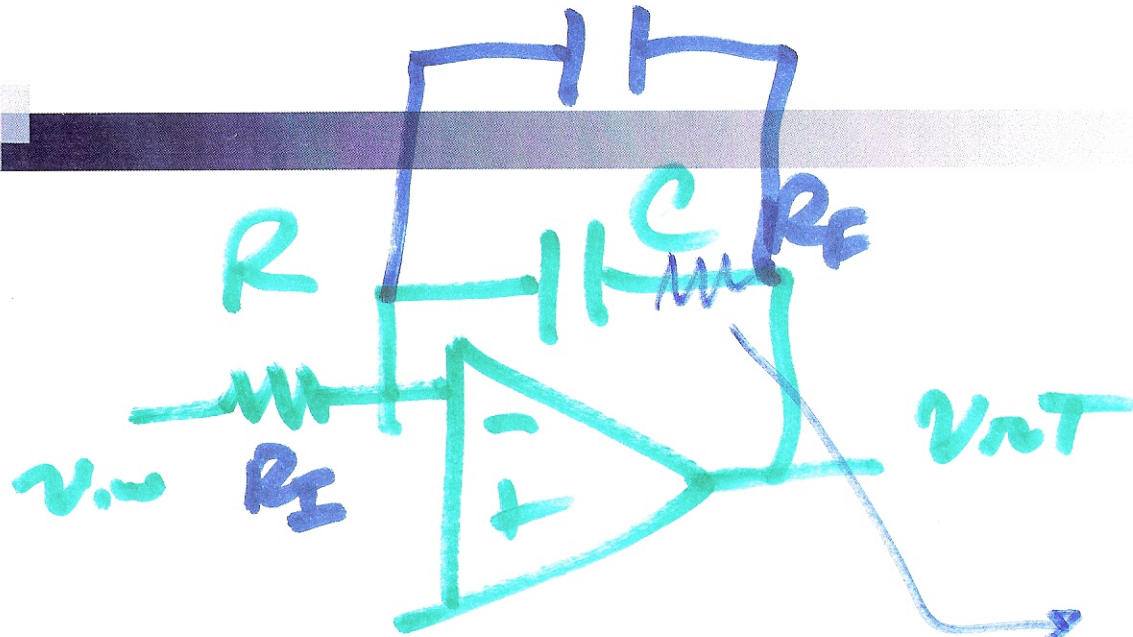
OCT. 20, 2010

$$\frac{1}{LC} \cdot \frac{1}{s - (-250 + 5kj)}$$

$$\cdot \frac{1}{s - (-250 - 5kj)}$$



ii)

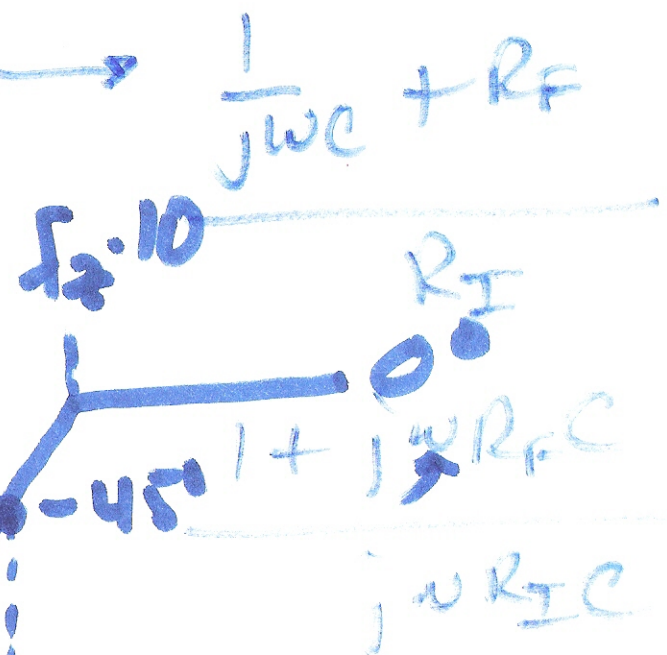


$$\frac{1}{SRC} = \frac{1/j\omega C}{R}$$

↑ pole

-90

$$f_z = \frac{1}{2\pi R_F C} = f_z$$



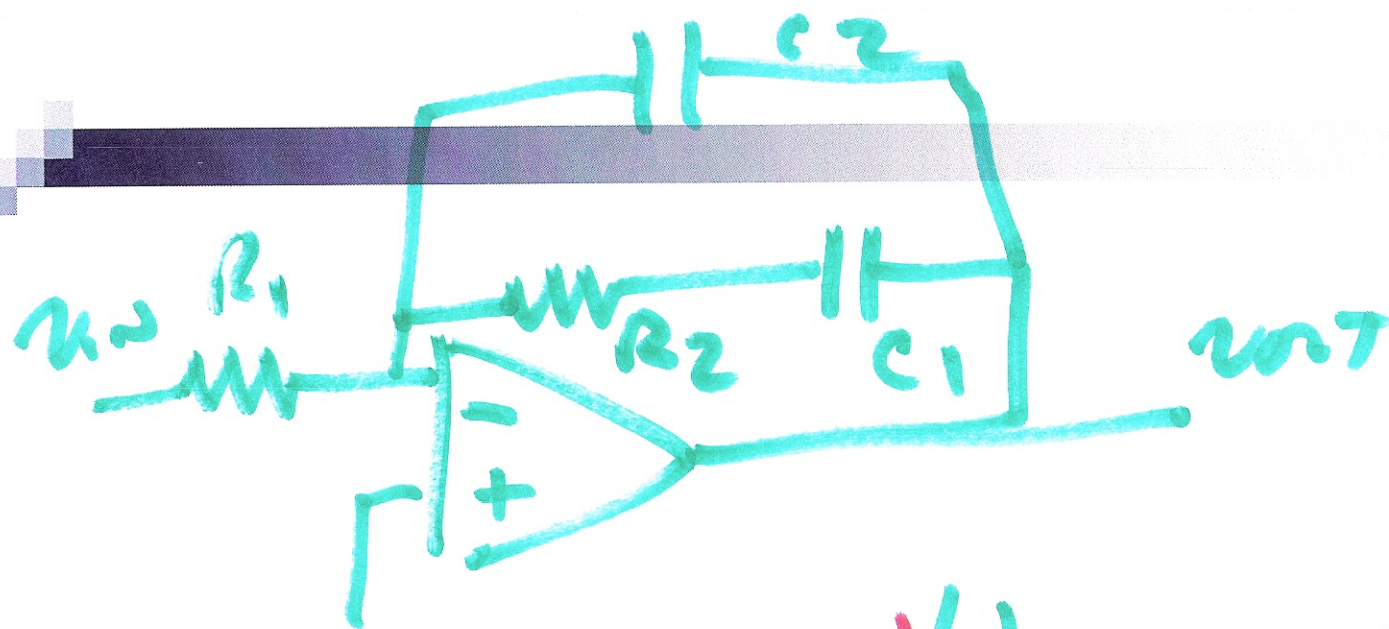
2)

# Proportional + Integral filter

$$\frac{1 + j\omega R_{FC}}{j\omega R_{IC}}$$

$$= \underbrace{\frac{R_F}{R_I}}_{\text{proportional}} + \frac{1}{s R_{IC}} \uparrow \text{integral}$$

3)



$$A = \frac{-\frac{v_{in}}{R_1} \left( \frac{1}{j\omega C_1} + R_2 \right) \cdot \frac{1}{j\omega C_2}}{\frac{1}{j\omega C_1} + R_2 + \frac{1}{j\omega C_2}}$$

$$= \frac{-\frac{1}{R_1} \left( \frac{1}{j\omega C_1} + R_2 \right)}{1 + j\omega C_2 R_2 + \frac{C_2}{C_1}}$$

4)

$$\frac{1}{1 + j\omega C_1 R_1} = -\frac{R_2}{R_1} \left( 1 + \frac{1}{j\omega C_1 R_2} \right) \cdot j\omega C_1 R_2$$

$$f = \frac{1}{T}$$

$$1 + \frac{R_2}{R_1} + j\omega C_1 R_2 \cdot j\omega C_1 R_2$$

$$\frac{1}{2\pi f_z \cdot C_1 R_2} = 1 \rightarrow f_z = \frac{1}{2\pi C_1 R_2}$$

$$\frac{R_2}{R_1} \cdot \frac{1}{j\omega R_1 C_1}$$

5)

$$-\frac{R_2}{R_1} (1 + j\omega C_1 R_2)$$

---

$$j\omega R_1 R_2 \left(1 + \frac{R_2}{C_1} + j\omega C_2 R_2\right)$$

6)