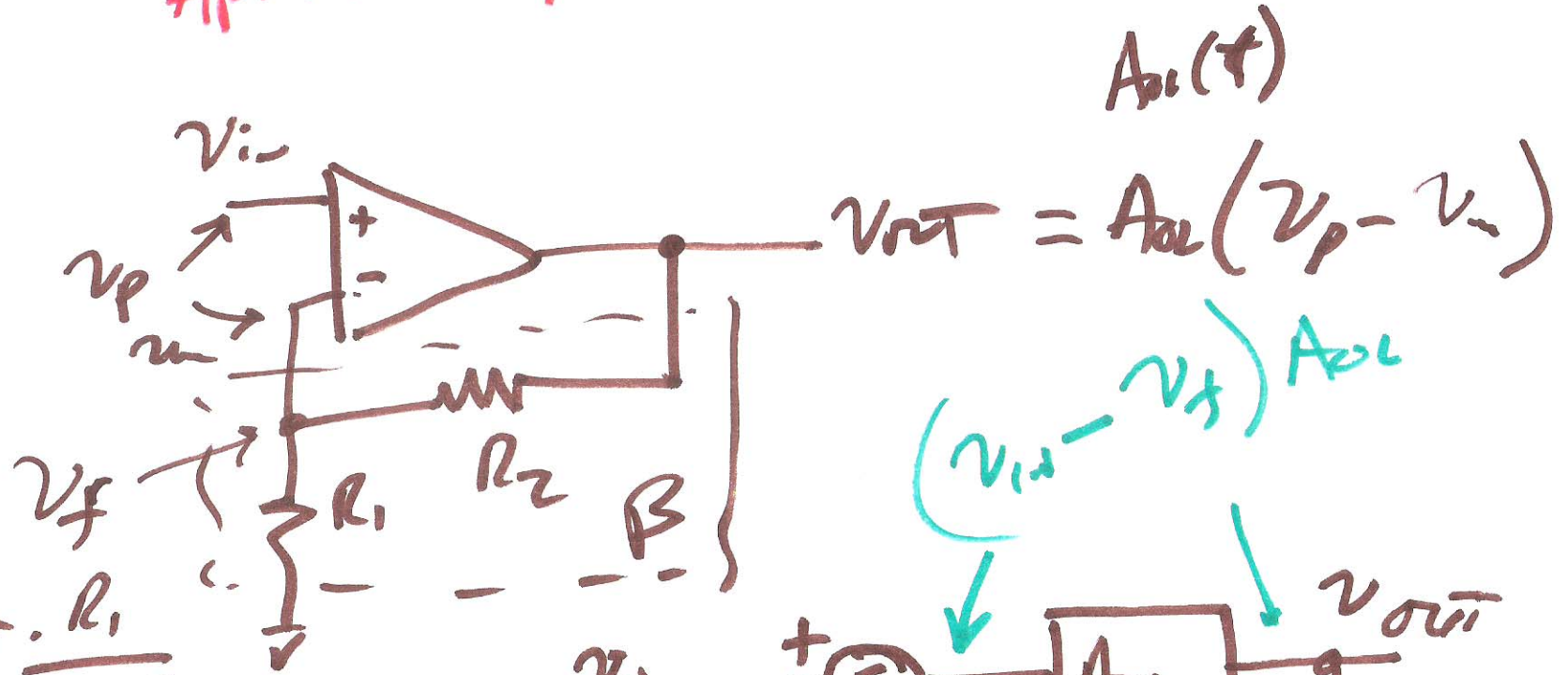


Gonzaga day 2

April 10, 2015



$$v_f = v_{out} \cdot \frac{R_1}{R_1 + R_2}$$

$$v_f = v_{out} \cdot \beta$$

$$v_{out} = A_{OL}(v_{in} - v_f)$$

$$A_{OL}(v_{in} - \beta v_{out})$$

$$v_f \rightarrow v_{out} + v_{out} \beta A_{OL} = A_{OL} v_{in}$$

1)

$$\frac{v_{out}}{v_{in}} = \frac{A_{OL}}{1 + \beta A_{OL}}$$

$$\beta A_{OL} = -1 \quad \text{UNSTABLE!}$$

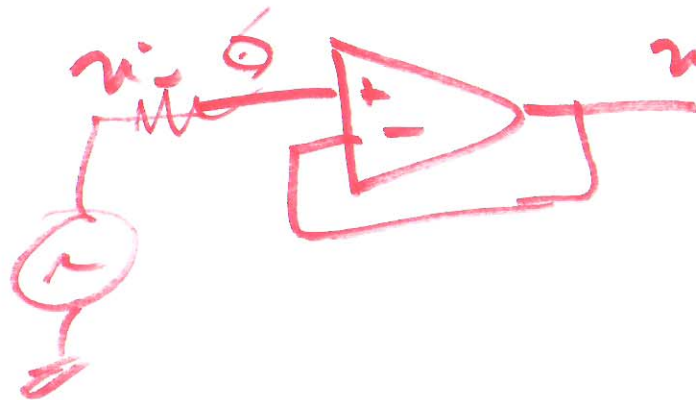
$\beta = 1$ Worst case

$$|A_{OL}| = 1$$

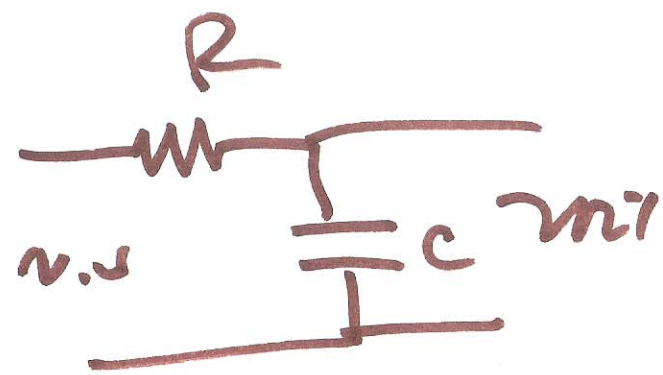
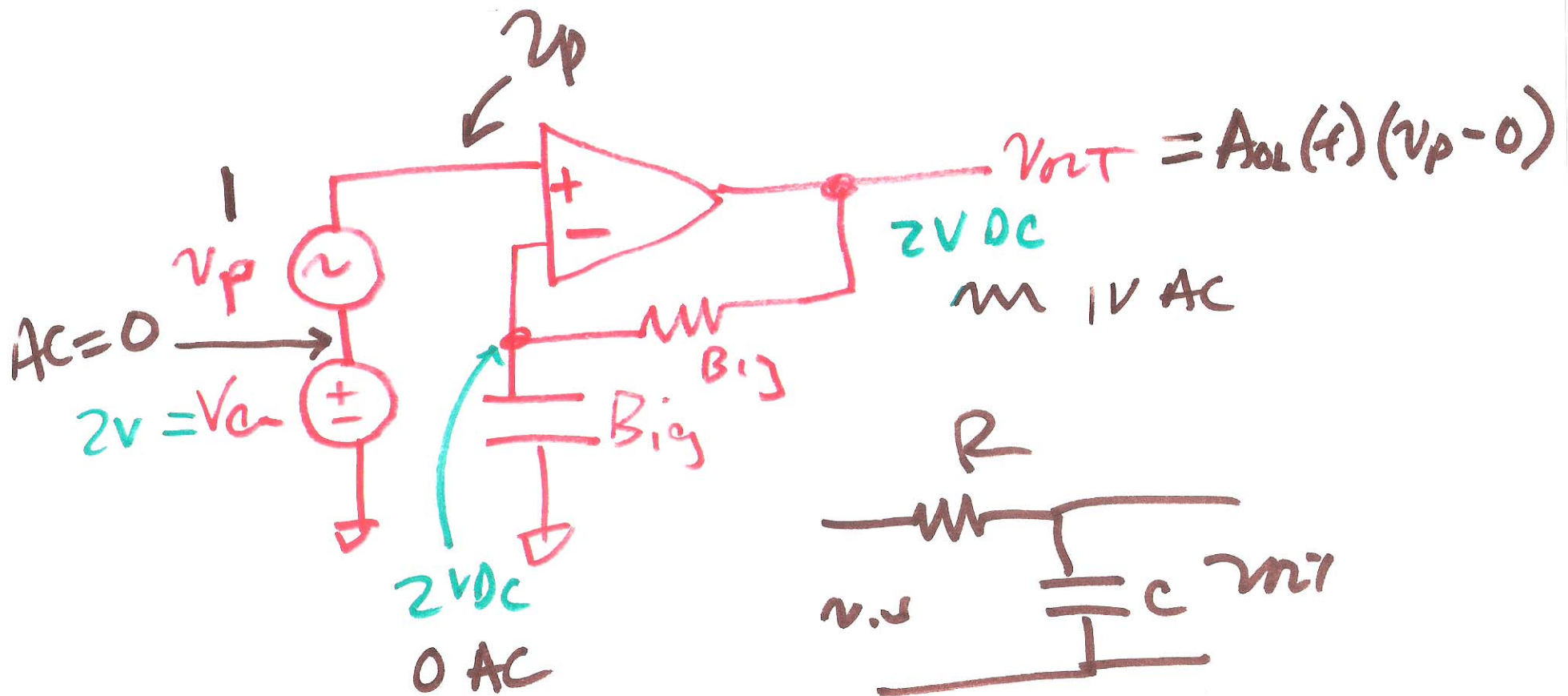
$$\angle A_{OL} = 180^\circ$$

$$\theta = \frac{t_d}{T} \cdot 360$$

$$m_i = t_d \cdot f \cdot 360$$



2)



$$\frac{1}{1 + j \frac{f}{\frac{1}{2\pi RC}}} = \frac{2\pi f}{2\pi f} = \frac{1}{1 + j 2\pi f RC}$$

$$f \gg \frac{1}{2\pi RC}$$

$$\frac{2\pi f}{2\pi f} \approx \frac{1}{j f 2\pi RC}$$

3)