

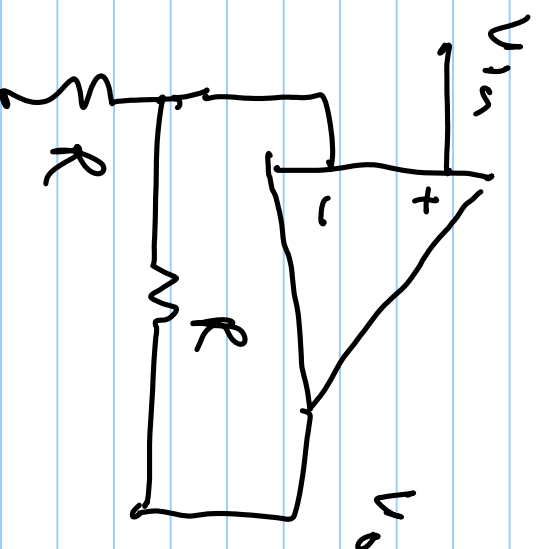
gain in closed loop

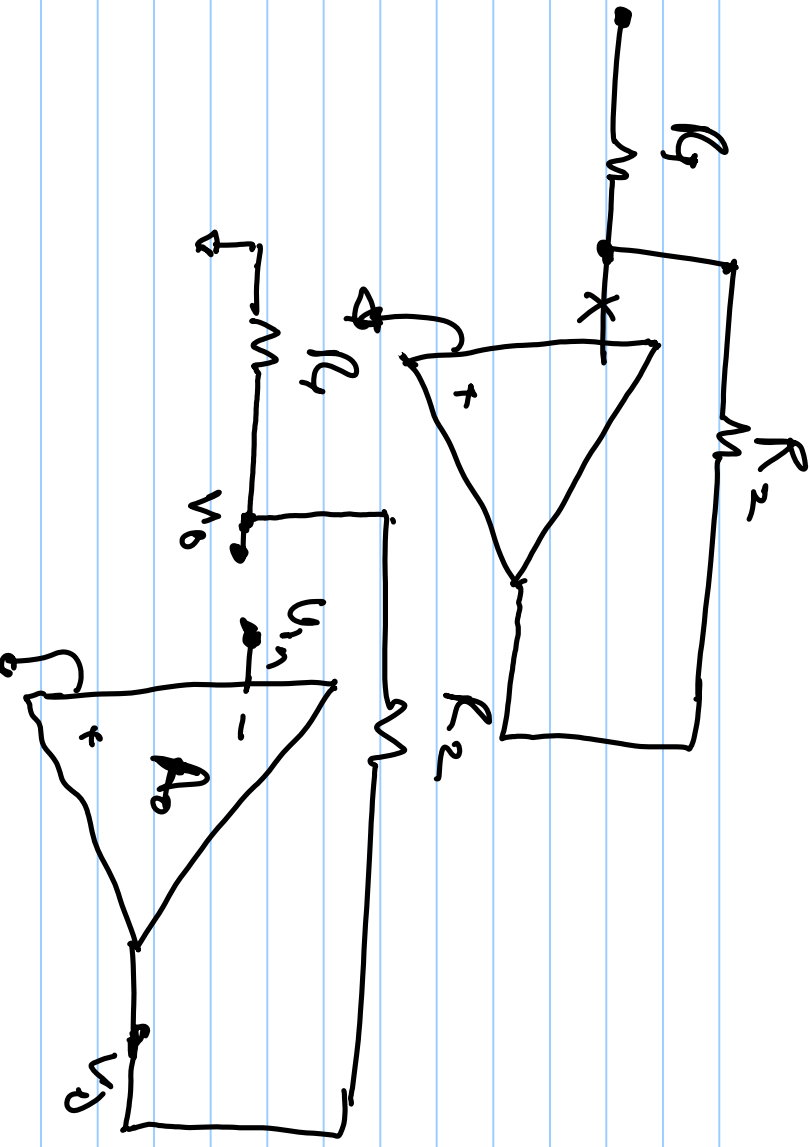
$$A \xrightarrow{1+A\beta} = \frac{1}{\beta}$$

$$A\beta \gg 1$$

$$\beta = \frac{1}{K} = \frac{V_o}{V_{in}}$$

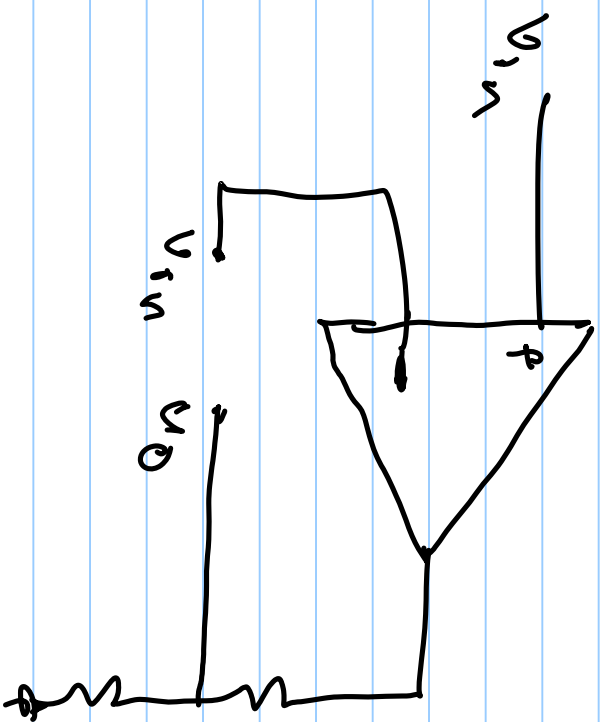
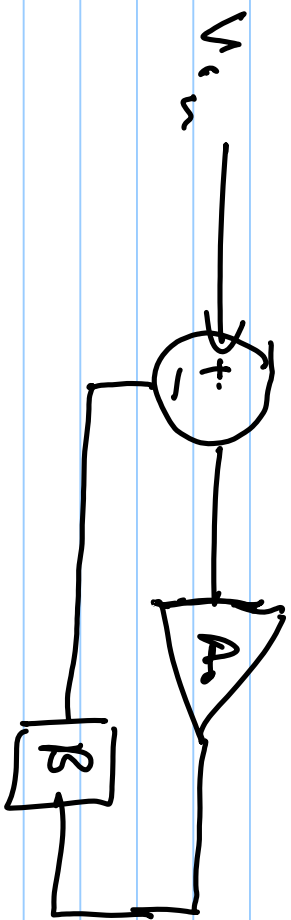
$$\frac{V_o}{V_o}$$





$$V_0 = \frac{R_2}{R_1 + R_2} \times A_0 V_{in}$$

$$\frac{A}{1 + A\beta}$$

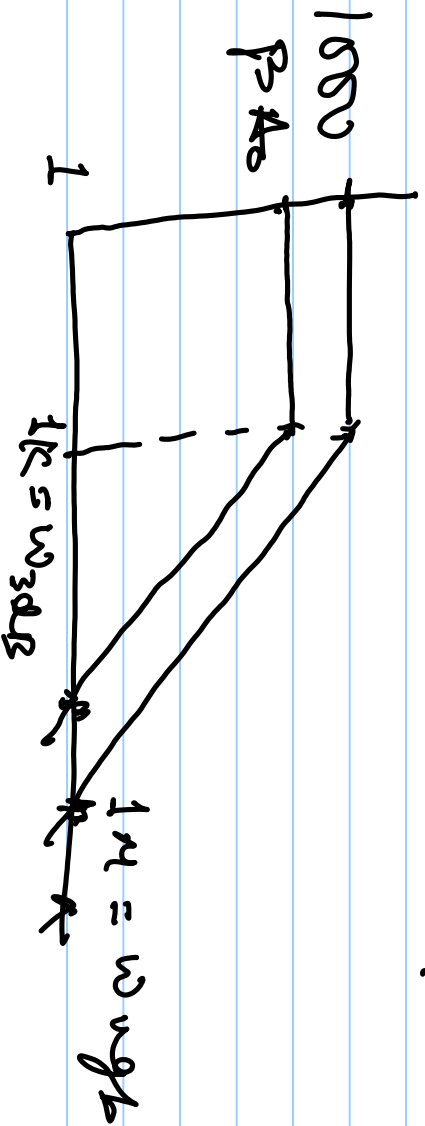


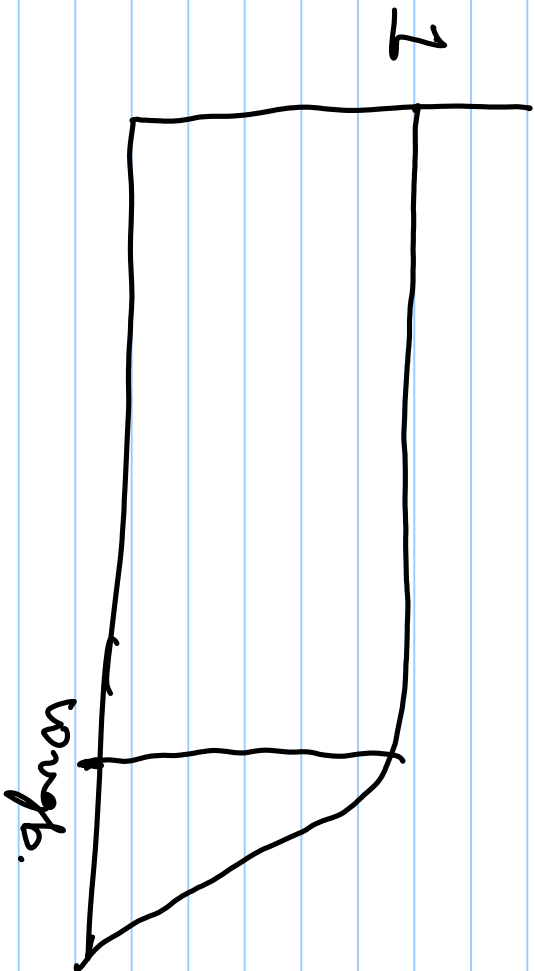
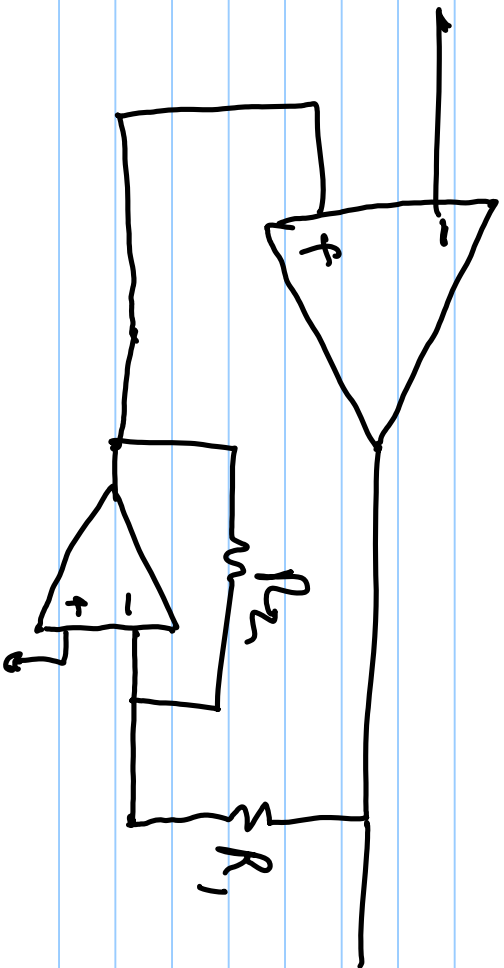
$$\frac{1}{1 + s/w_p} = \frac{1}{s/w_p + 1}$$

$$= \frac{w_p}{s + w_p} \times \frac{s + jw}{s - jw}$$

$$H(s) = \frac{\beta A_0}{1 + s/\omega_p}$$

$$\omega_p = 1/R_{\text{rod}} / \text{sec}, \quad A_0 = 1000$$





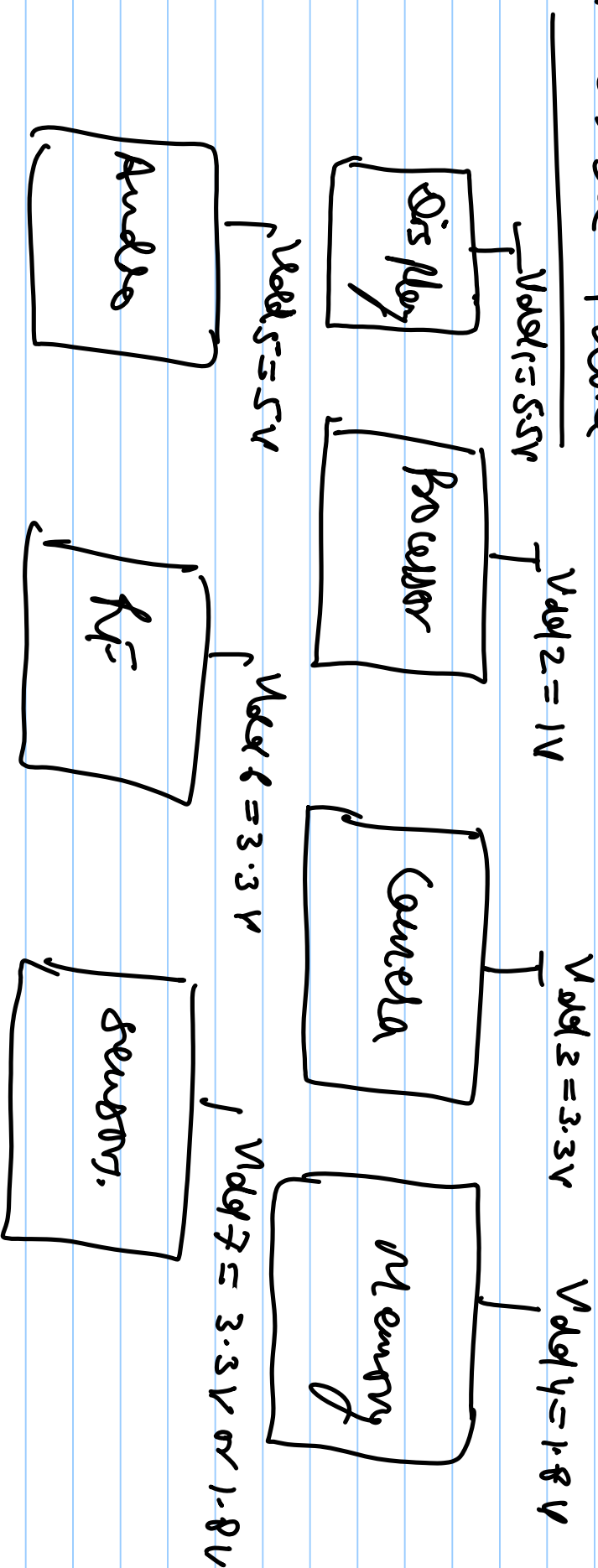
Voltage Regulators

→ Voltage Regulator is used to convert one dc voltage level to another dc voltage level.

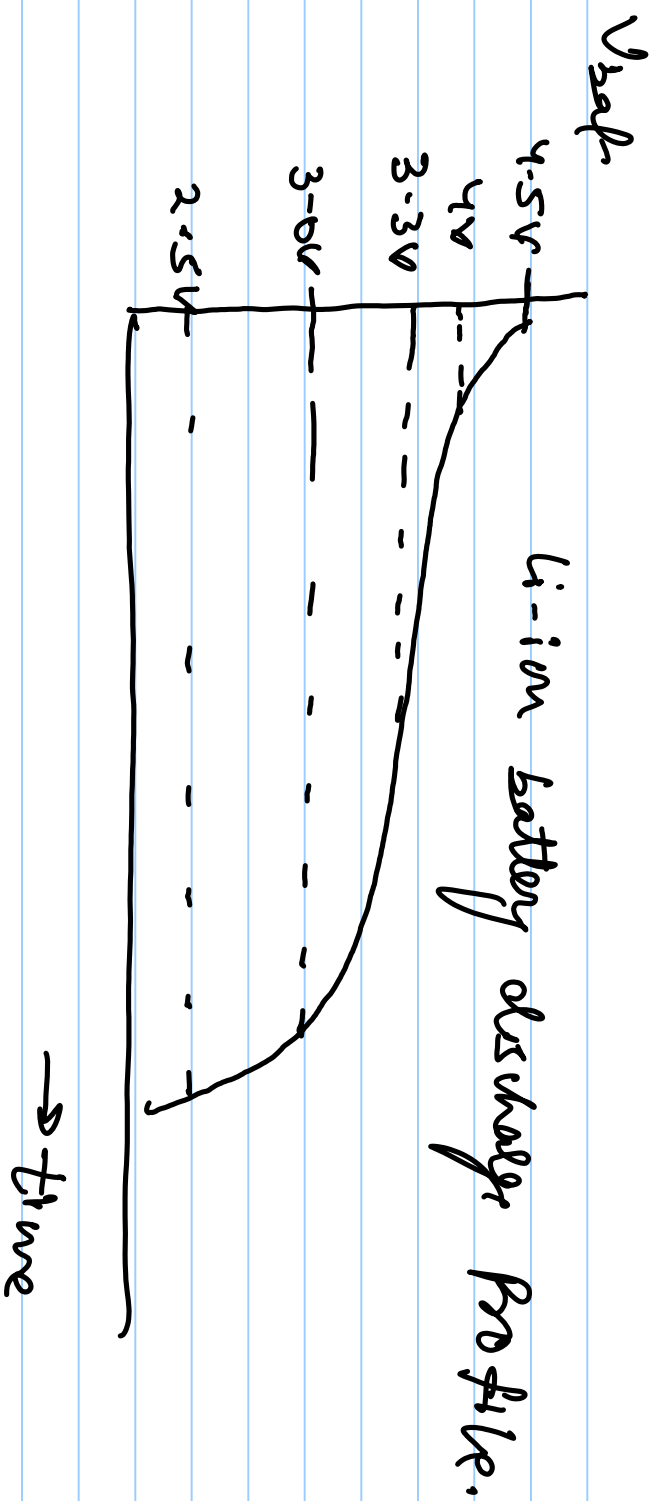
→ Also known as DC-DC converters.

Why do we need Voltage Regulator?

Mobile phone



Voltage source in mobile phone \rightarrow Battery



$V_{bat} = 3.0V$ to $4.5V \rightarrow$ variable

$V_{bat} =$ constant (51.6%)

