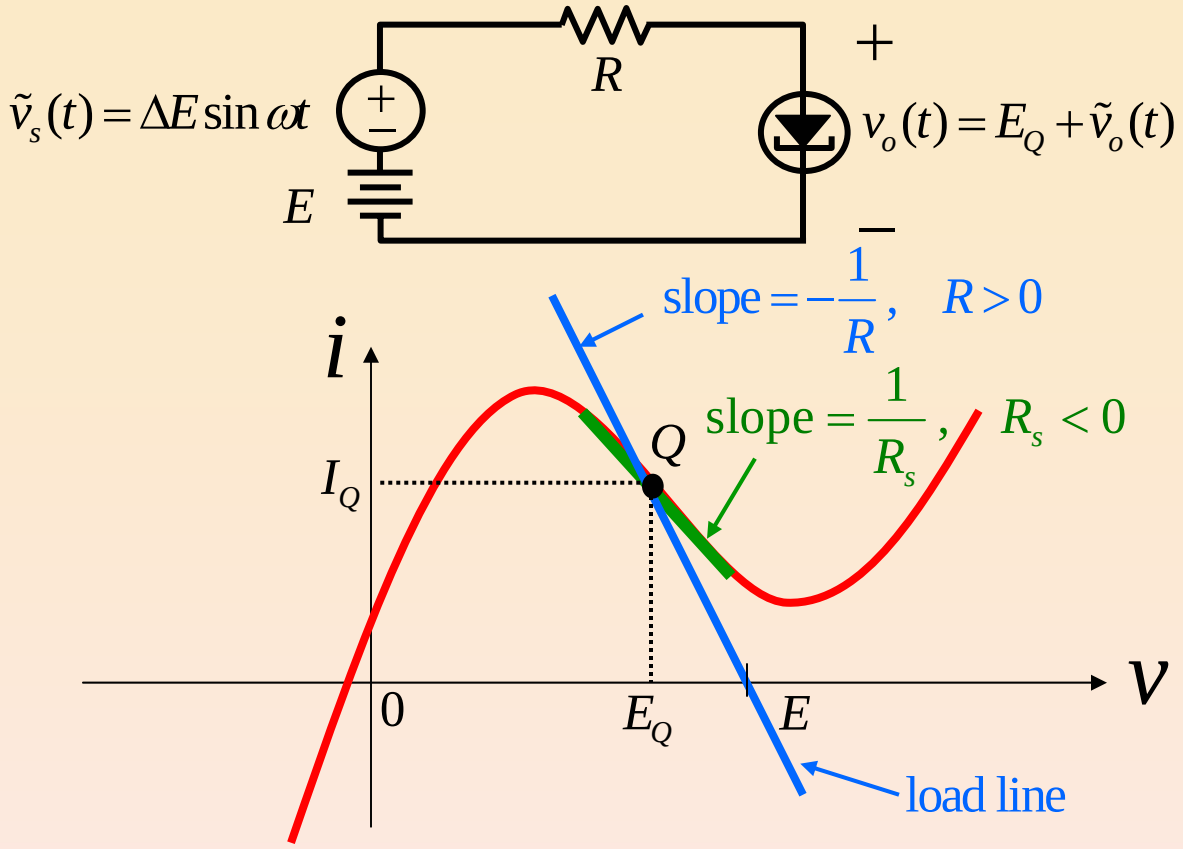
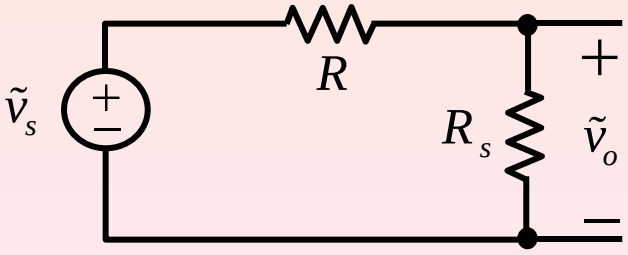
Voltage Amplifier



Small-signal Equivalent Circuit



$$\tilde{v}_o(t) = \frac{R_s}{(R + R_s)} \tilde{v}_s(t)$$

Example: $R = 0.5K$, $R_s = -1.0K$,

$$\tilde{v}_o(t) = \frac{-10^3}{(0.5 - 1.0)10^3} \tilde{v}_s(t)$$

$$= \frac{-1.0}{-0.5} \tilde{v}_s(t) = 2\,\tilde{v}_s(t)$$

$\therefore$ We have a small-signal **voltage amplifier** with a ***voltage gain***

$$G \triangleq \frac{\tilde{v}_o}{\tilde{v}_s} = 2.$$