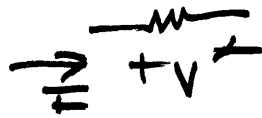


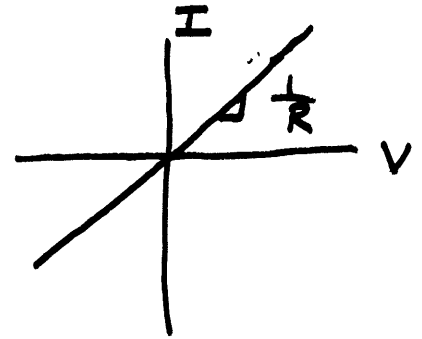
Electronic devices are nonlinear

~~LINEAR~~ LINEAR:



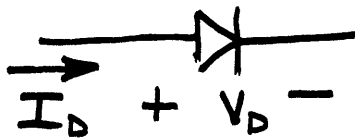
$$V = IR$$

$$I = \frac{V}{R}$$



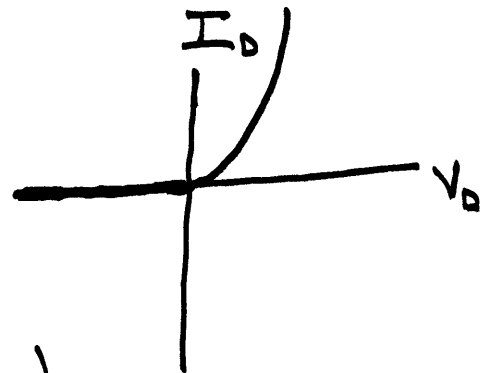
NONLINEAR

EXAMPLE: DIODE



$$I_D = I_S \left(e^{\frac{V_D}{V_T}} - 1 \right)$$

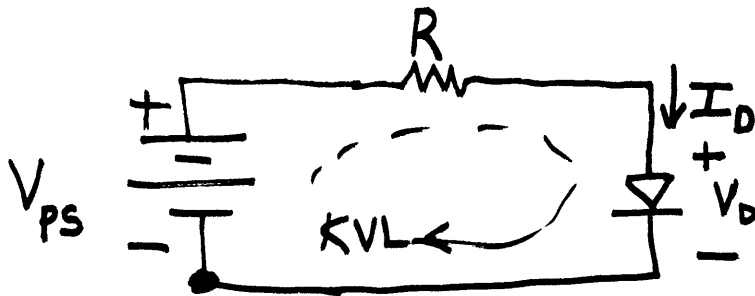
↑ SATURATION CURRENT



← DIODE EQUATION

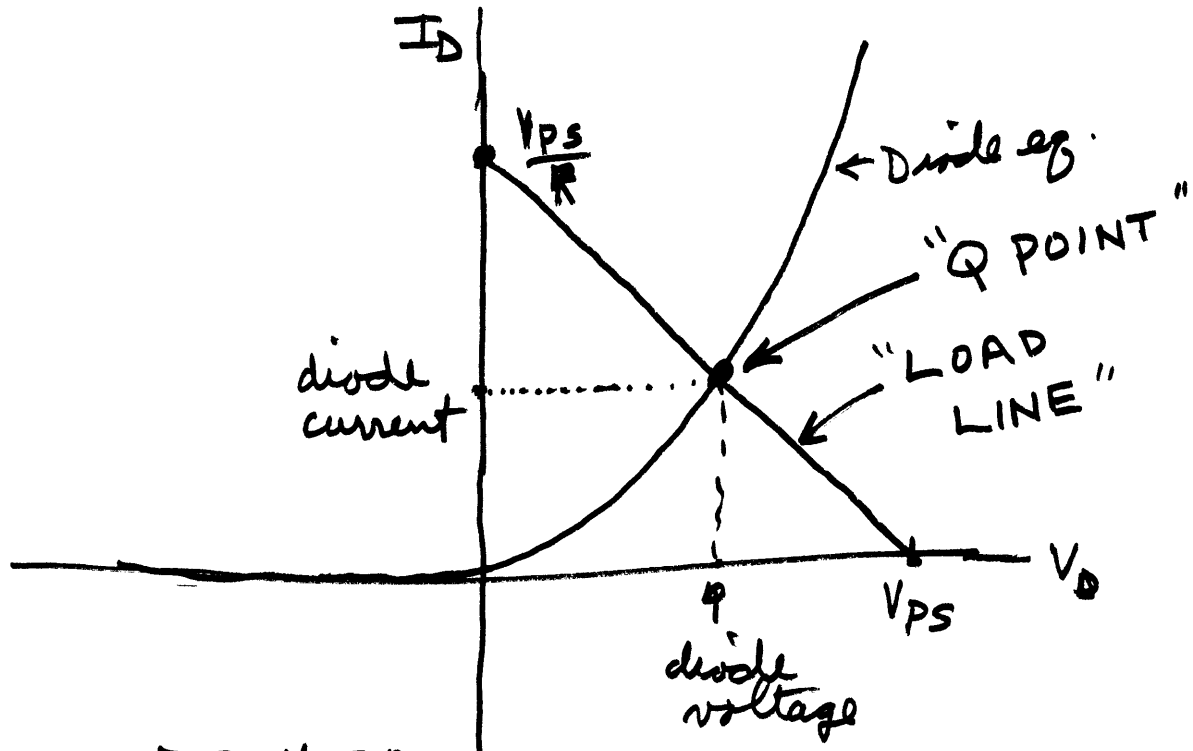
$V_T =$ THERMAL VOLTAGE

$V_T \approx 0.026 \text{ V.}$
(26mV)



$$\text{KVL: } -V_{PS} + I_D R + V_D = 0$$

$$-V_{PS} + I_S \left(e^{\frac{V_D}{V_T}} - 1 \right) R + V_D = 0$$



$$-V_{PS} + I_D R + V_D = 0$$

$$I_D = \frac{V_{PS} - V_D}{R} = \frac{V_{PS}}{R} - \frac{V_D}{R} = -\frac{1}{R}(V_D) + \frac{V_{PS}}{R}$$

FOR FRIDAY READ PP 30-39

FOR NEXT WED. READ CHAPTER 1
(SEMICONDUCTOR THEORY)