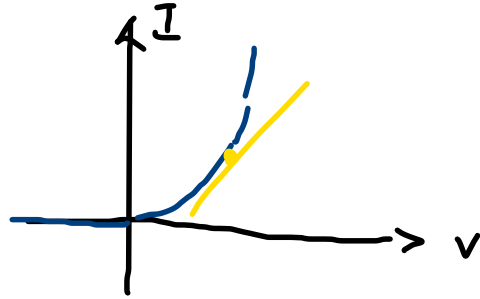
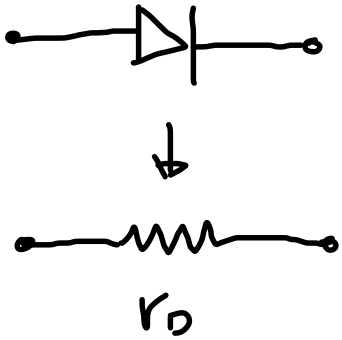


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$$I = I_s \left( e^{\frac{v}{nV_T}} - 1 \right)$$

$$r_D = n \cdot \frac{V_T}{I_D} \sim 25 \text{ mV}$$

$$\rightarrow \begin{matrix} 1 & \text{Ge} \\ 2 & \text{Si} \end{matrix}$$

$$I_D = 10 \text{ mA} \quad r_D \approx 2 \cdot \frac{25 \text{ mV}}{10 \text{ mA}} = 5 \Omega$$

$$I_D = 10 \text{ nA} \quad r_D \approx 2 \cdot \frac{25 \cdot 10^{-3}}{10 \cdot 10^{-6}} = 2 \cdot \frac{25}{10 \cdot 10^{-3}} = 5 \cdot 10^3 = 5 \text{ k}\Omega$$

