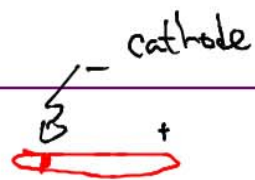
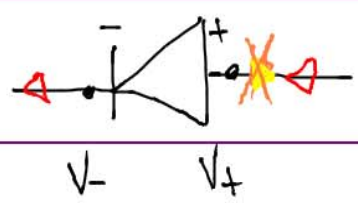
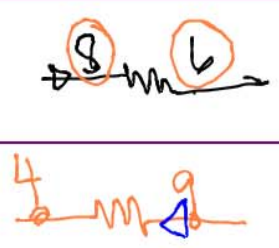


curve:  $\omega$



diode



$v_+ - v_- > 0$  ✓

$v_+ - v_- < 0$  ✗

Resistor  $i R$   
 $a + v - b$

$v_a - v_b < 0$   
 $v_a < v_b$

$V_{ab} \equiv V_a - V_b$



$V_{ab} > 0$   
 $V_{ab} < 0$

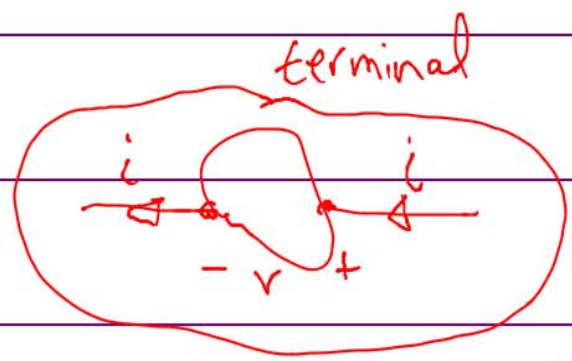
$V_{ab} = R i$  ✓

$E_{if} \equiv E_f - E_i$

سالبه موجبة سال

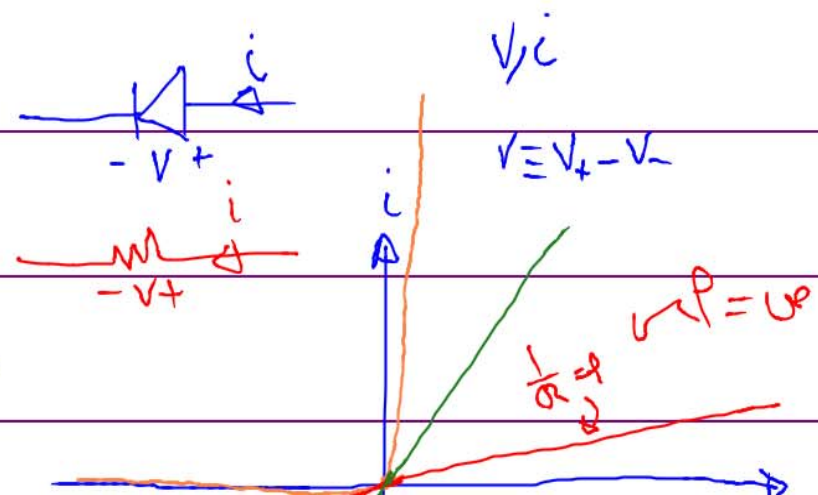
$v = R i = i R$  قانون ادم ✓

$\frac{v}{i} = R$



$p = v * i$

i-v curve



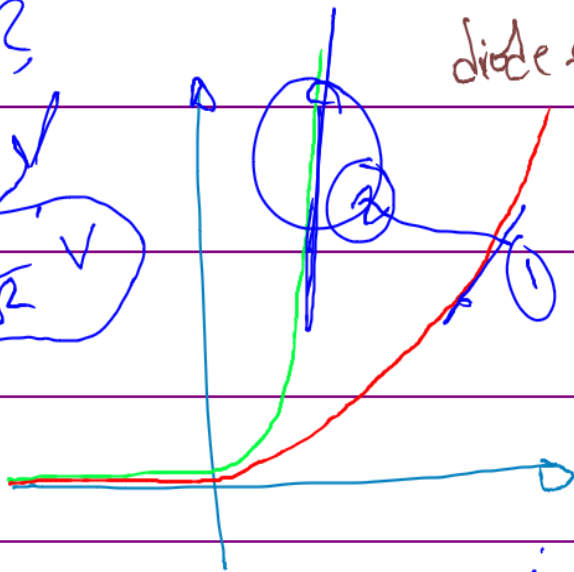
$$R = \frac{V}{I}$$

$$V = IR$$

$$I = \frac{1}{R} V$$

$$I(V) = \frac{1}{R} V$$

diode curve



- ② ✓
- ① ✗

- ③  $\approx 1$  Ge
- $\approx 2$  Si

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

$$10^{-6} A \approx I_s$$

$$e \approx 2.7182$$

$$\frac{1}{n} \approx \frac{1}{11586}$$

$$T \approx 50^\circ C$$

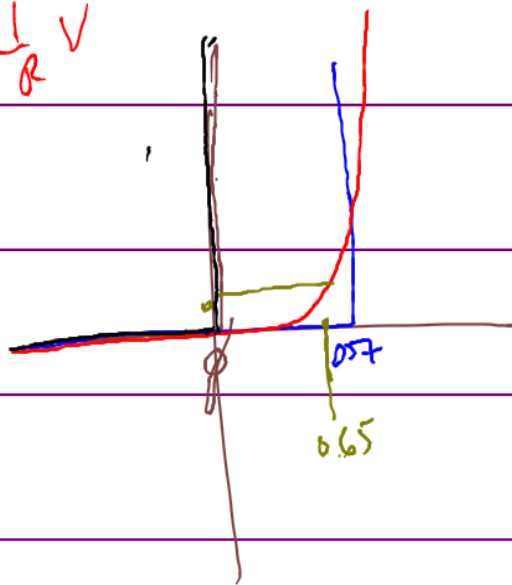
$$273 + 50 = 323 K$$

Diode Curves

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

$$I = \frac{1}{R} V$$

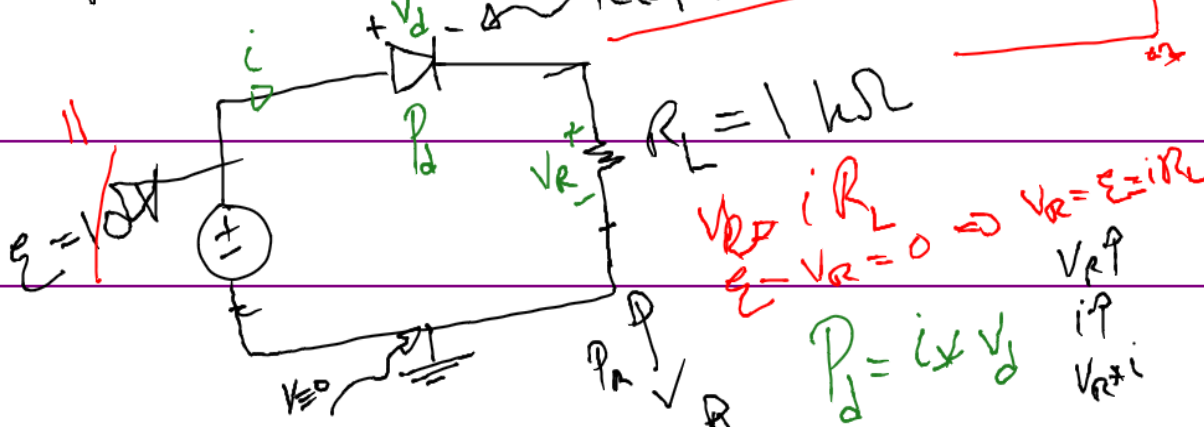
1st approximation  
2nd approximation



Up-down

circuit analysis  
ideal diode

P. power

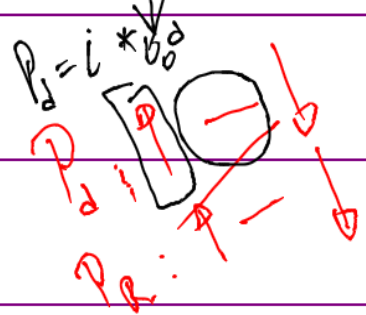


$V_d = iR_L \Rightarrow V_R = \epsilon - iR_L$   
 $\epsilon - V_R = 0$   
 $V_R \uparrow$   
 $i \uparrow$   
 $V_R \downarrow$

$P_d = i \times V_d$   
 $P_R = i \times V_R$

$P = i \times V_R$

Variables  $P_T = P$



$P_T = P_d + P_R$