

$$i_1 = -\frac{i_2}{1+\beta}$$

$$i_g = -(1+\beta)i_1 \quad U_g - i_g R_1 + i_1 R_2 = 0$$

$$U_g = i_g R_1 + \frac{i_g R_2}{1+\beta} \quad i_g \left(R_1 + \frac{R_2}{1+\beta} \right) = U_g \quad i_g \left(\frac{R_1(1+\beta) + R_2}{1+\beta} \right) = U_g$$

$$R_E = \boxed{R_1 + \frac{R_2}{1+\beta}}$$

$$U_{CB} = -\beta i_1 R_3 = i_g \cdot \frac{\beta R_3}{\beta+1} \quad i_g = \frac{1+\beta}{R_1(1+\beta) + R_2} U_g$$

$$U_{CB} = \frac{\beta R_3}{R_1(1+\beta) + R_2} U_g$$

$\downarrow \frac{U_{CB}}{U_g}$

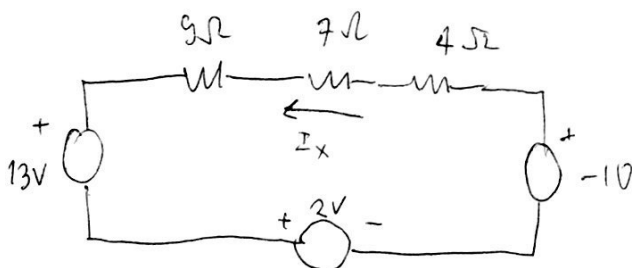
4)

$$U_{AB} = -12 + 16 + 9 = \boxed{13V = U_T}$$

$$\boxed{R_T = 9\Omega}$$

$$\boxed{U_{CD} = -10V = U_T}$$

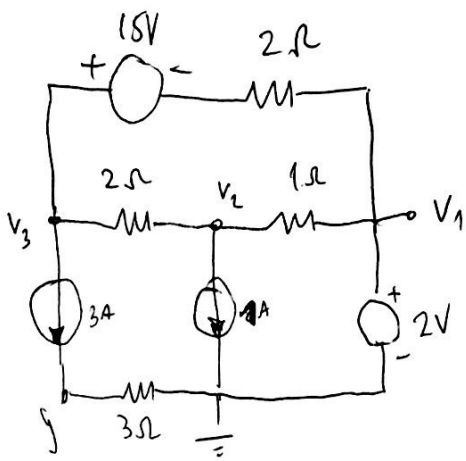
$$R_{CD} = R_T = 4\Omega$$



$$I_x \cdot 20 + 10 + 2 + 13 = 0$$

$$I_x = -\frac{25}{20} = -\frac{5}{4}$$

$$P_7 = \frac{25}{16} \cdot 7 = 10,9375 \text{ W}$$



$V_1 = 2V$

$$\frac{V_3}{2} - \frac{V_2}{2} - \frac{V_1}{2} = \frac{15}{2} - 3 \quad | \cdot 2$$

$$2V_3 - V_2 - 2 = 9$$

$$2V_3 - V_2 = 11$$

$$V_2 \cdot \frac{3}{2} - \frac{V_3}{2} - V_1 = -1$$

$$3V_2 - V_3 = 2$$

$2V_2 = 9$
 $V_2 = 4.5V$

$$2V_3 - V_2 = 11$$

$$6V_2 - 2V_3 = 4$$

$$5V_2 = 15 \quad | \quad V_2 = 3V \quad | \quad V_3 = 7V$$

$I_B = 2A$

$I_C = 1A$

$I_D = -4A$

$I_A = -5A$

$1 + X = -4$

$X =$

$P_{1A} = -3W$

$P_{2V} = 8W$

$P_{15V} = 75W$

$P_{3A} = 6W$