

תנאי: $V_A = 5V$

$$I_2 = I_3$$

(1c)

$$\frac{V_A - 3}{1K} = \frac{3 - (-3)}{3K}$$

$$V_A = 5V$$

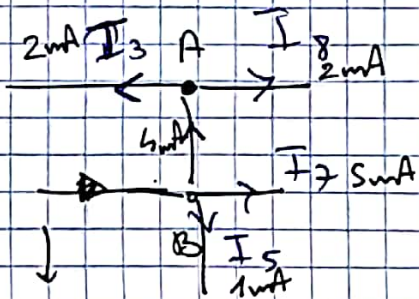
$$V_B = 5V$$

$$I_8 = \frac{V_A - 0}{R_8} = 2mA$$

$$I_7 = \frac{V_B - 0}{R_7} = 5mA$$

$$I_5 = \frac{V_B - 0}{R_5} = 1mA$$

$$I_3 = \frac{5 - 3}{1K} = 2mA$$



$$I_4 = 4mA + 5mA + 1mA = 10mA$$

תנאי: $V_C = 15V$

$$\frac{V_C - V_B}{R_4} = 10mA$$

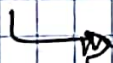
$$\rightarrow V_C = 15V$$

(1d)

$$V_C = 15V$$

$$I_4 = I_7 + I_8$$

$$\frac{V_0 - 0}{R_9} = I_4 = 7mA$$



$$V_0 = -7V$$

$$I_1 = I_2$$

(1c)

(2)

$$\frac{0 - V_i}{R_1} = \frac{V_A - 0}{R_2} \rightarrow \boxed{V_A = -3V_i}$$

$$V_B = -3V_i - 3V$$

$$V_C = -3V_i - 3 - 3 = -3V_i - 6$$

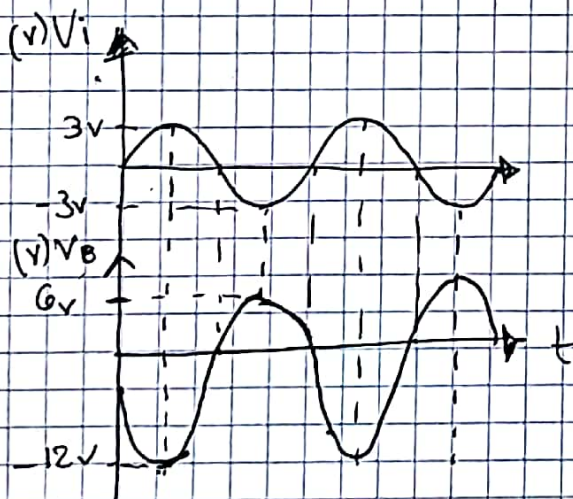
$$V_C = -3V_i - 6 \rightarrow \begin{matrix} V_i = 3V \rightarrow V_C = -15V \\ V_i = -3V \rightarrow V_C = 3V \end{matrix} \quad (2)$$

$$I_3 = \frac{V_C - 0}{R_3} = \frac{-15 - 0}{0.5k} = -30mA$$

P > 500, P < 0
N < 0, N > 0

$$I_3 = \frac{V_C - 0}{R_3} = \frac{3 - 0}{0.5k} = 6mA$$

P < 0, P > 0
N > 0, N < 0



$$V_B = -3V_i - 3 \quad (2)$$

$V_{B \text{ max}} = -12V \quad V_i = 3V$
 $V_{B \text{ min}} = 6V \quad V_i = -3V$

$$V_A = -6V$$

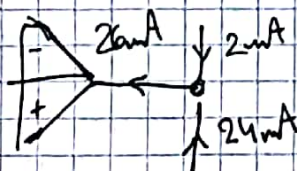
$$V_C = -12V$$

$$I_2 = \frac{0 - V_A}{R_2} = 2mA$$

$$V_i = 2V$$

(3)

$$I_3 = \frac{0 - V_C}{R_3} = 24mA$$



$$\boxed{I_0 = I_2 + I_3 = 26mA}$$