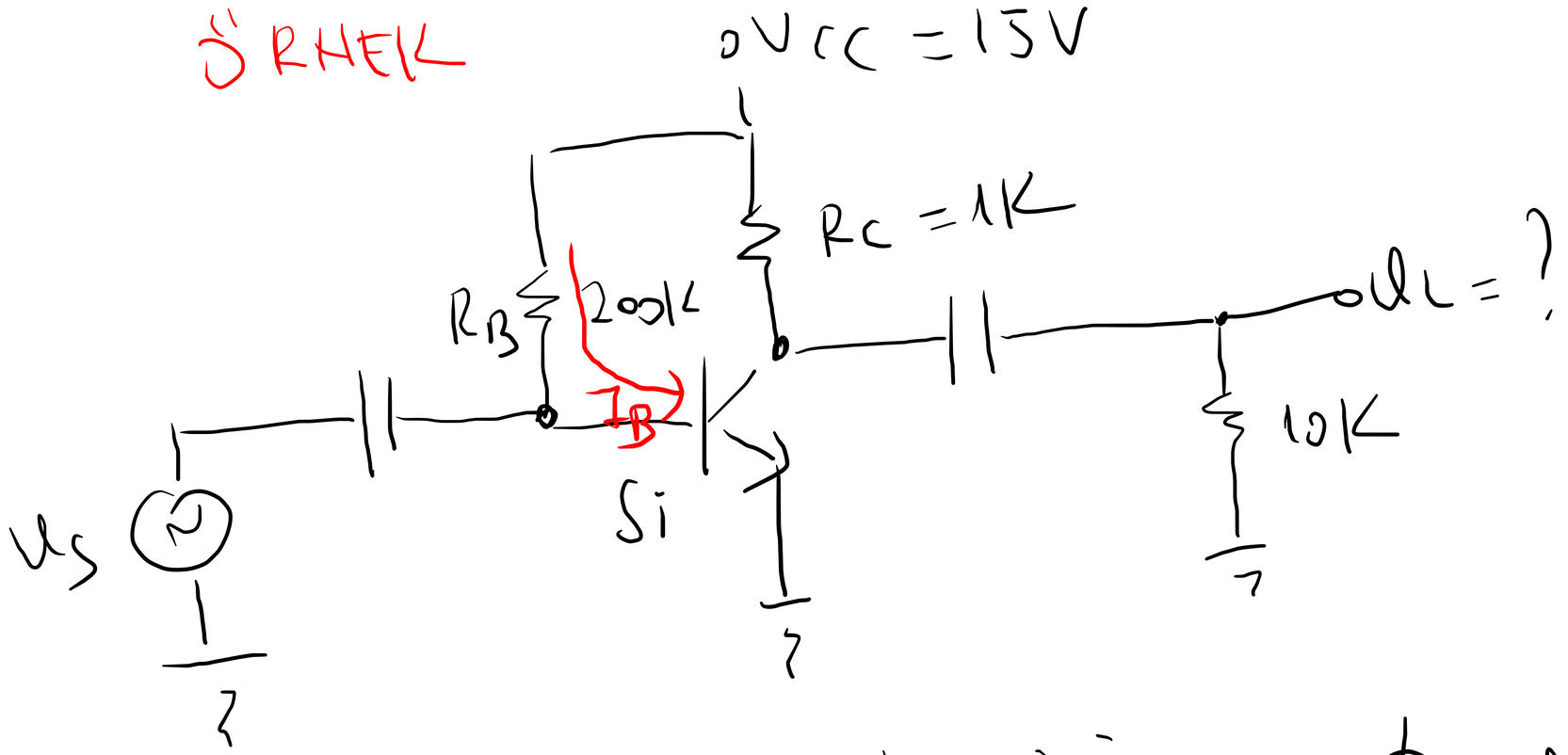
ÖRNEK



$\beta = 100$

$V_{BE} = 0,7V$

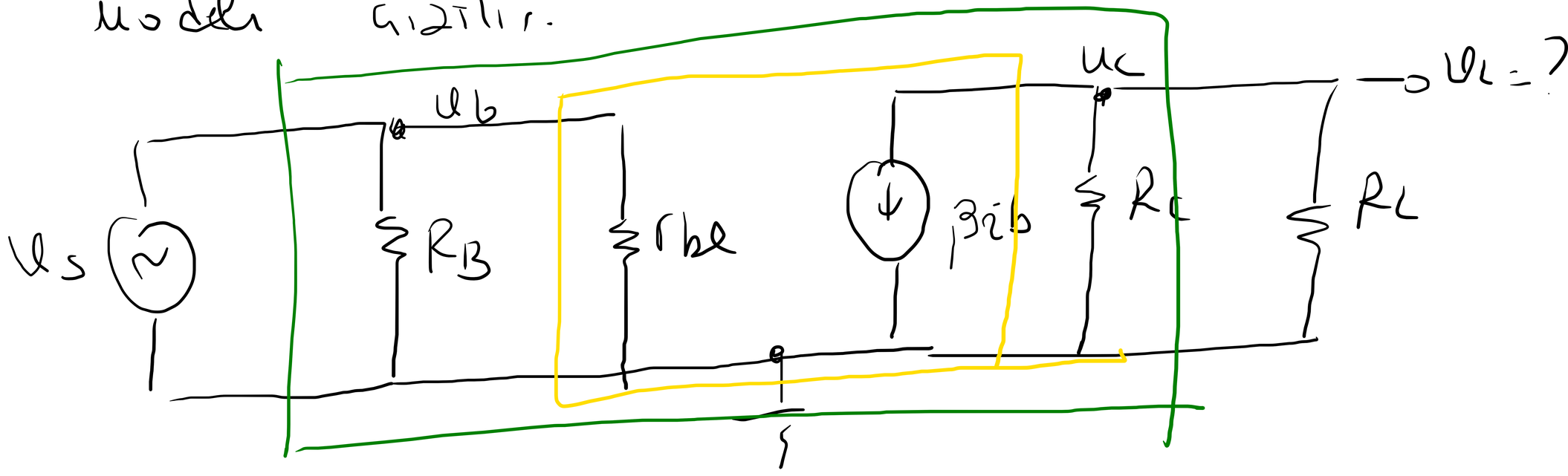
$V_S = 20mV$ (rms)

işaret üreteçinin iç direnci $r_s = 0$ olarak kabul edelim.

Kuvvetlendiricinin çıkışından alınan gerilim değeri nedir? V_L = ?

Kuvvetlendiricinin küçük – işaret

modeli çizilir.



$$A_V = \frac{v_L}{v_S} = \frac{v_L}{v_c} \times \frac{v_c}{v_b}$$

$$= \left(\frac{R_L}{R_C + R_L}\right) \times \left(-\beta \frac{R_C}{r_{be} // R_B}\right)$$

$R_{in(stage)}$

$r_{be} = (\beta+1)\, r_e$ $\quad r_e = ?$

$$r_e = \frac{26mV}{I_E} = \frac{26mV}{7,27mA} = 3,6\Omega$$

$$I_B = \frac{V_{CC} - V_{BE}}{R_B} = \frac{15V - 0,7V}{200K} = 71,5\mu A$$

$$I_E = (\beta + 1) I_B$$

$$I_E = (100 + 1) \times 71,5\mu A$$

$$I_E = 7,22mA$$

$R_{in}(\text{étage}) = R_3 \,//\, r_{be}$

$= 200K \,//\, 361,71\Omega$

$r_{be} = (\beta+1)\, r_e = (100+1)\cdot 3,6\Omega$

$= 361,71\Omega$

$r_{be} << R_3$ el dominador

$R_{in}(\text{étage}) = 361,71\Omega$

$$A_V = \frac{v_L}{v_S} = \frac{v_L}{v_c} \times \frac{v_c}{v_b}$$

$$= \left(\frac{R_L}{R_c + R_L}\right) \times \left(-\beta \times \frac{R_C}{r_{be}}\right)$$

$$= \left(\frac{10K}{1K + 10K}\right) \times \left(-100 \times \frac{1K}{361,71\,\Omega}\right)$$

$$= 0,909 \times (-276,46)$$

$$= -251,3$$

$V_{out} = ?$

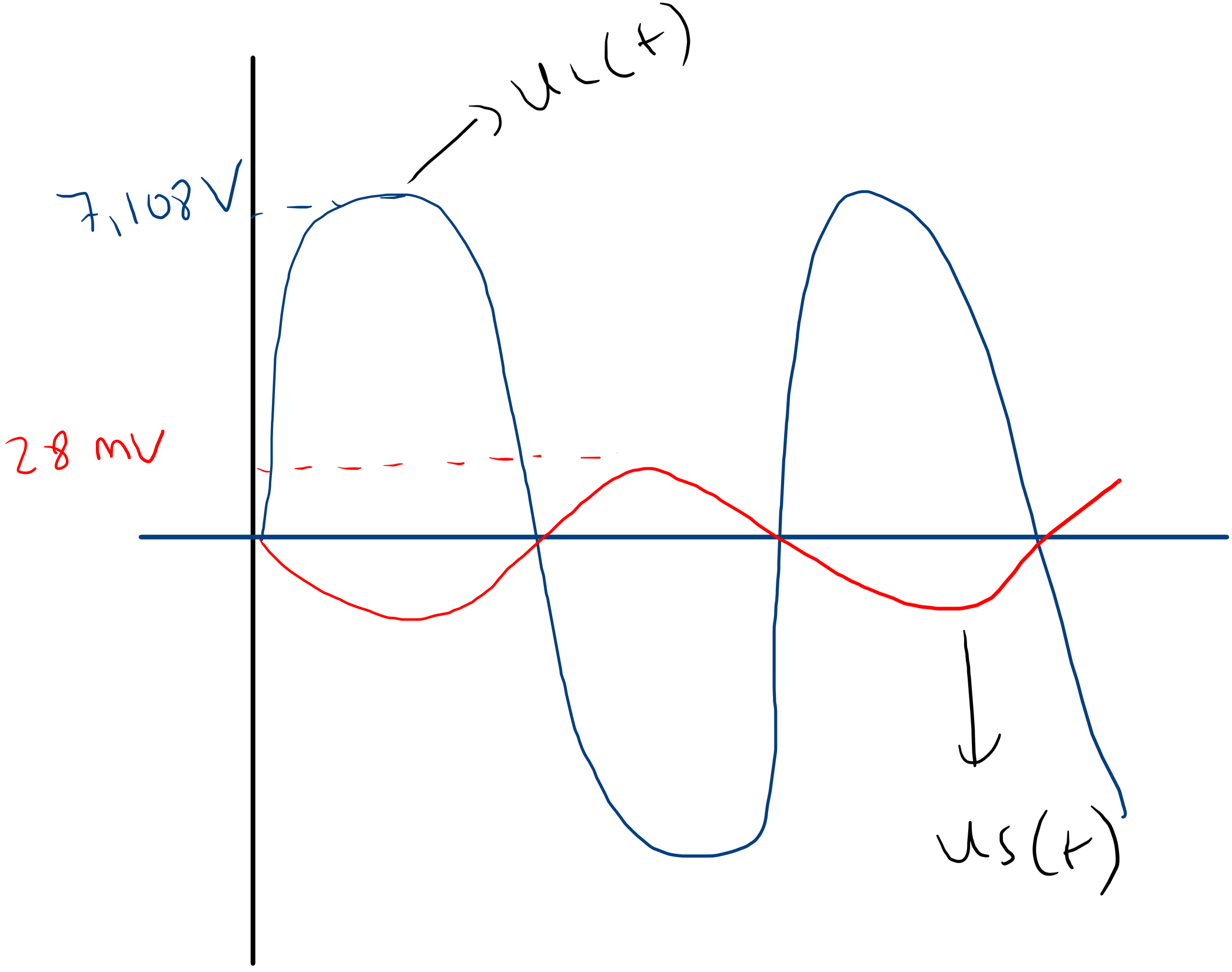
$$v_L = v_s \times A_v$$

$$= 20mV(rms) \times (-251.3)$$

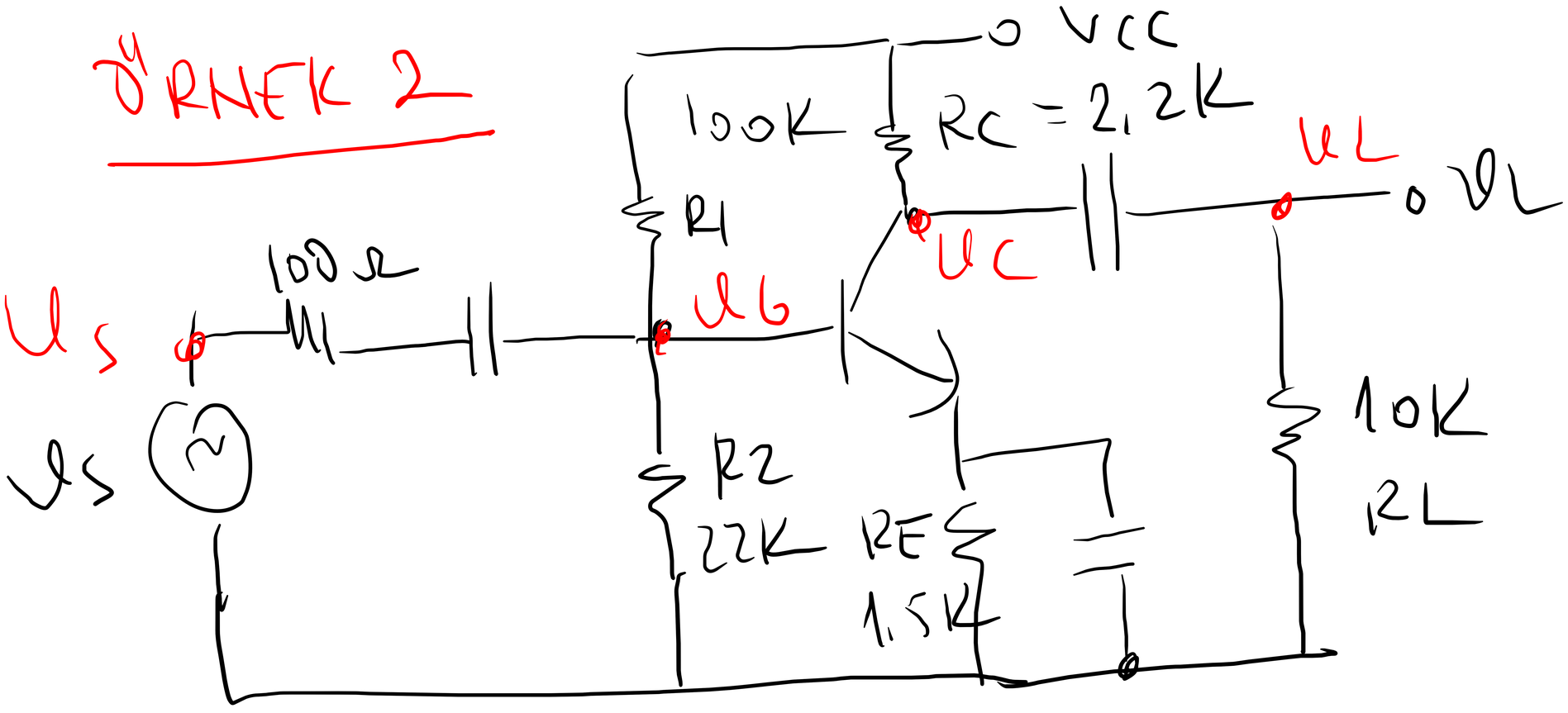
$$= 5{,}026\,V\ (rms)$$

$v_s \rightarrow 20mV\ (rms) \longrightarrow$ Sin wave ise

$v_L(t)$, $v_s(t)$ aynı t düzleminde çizmiz?

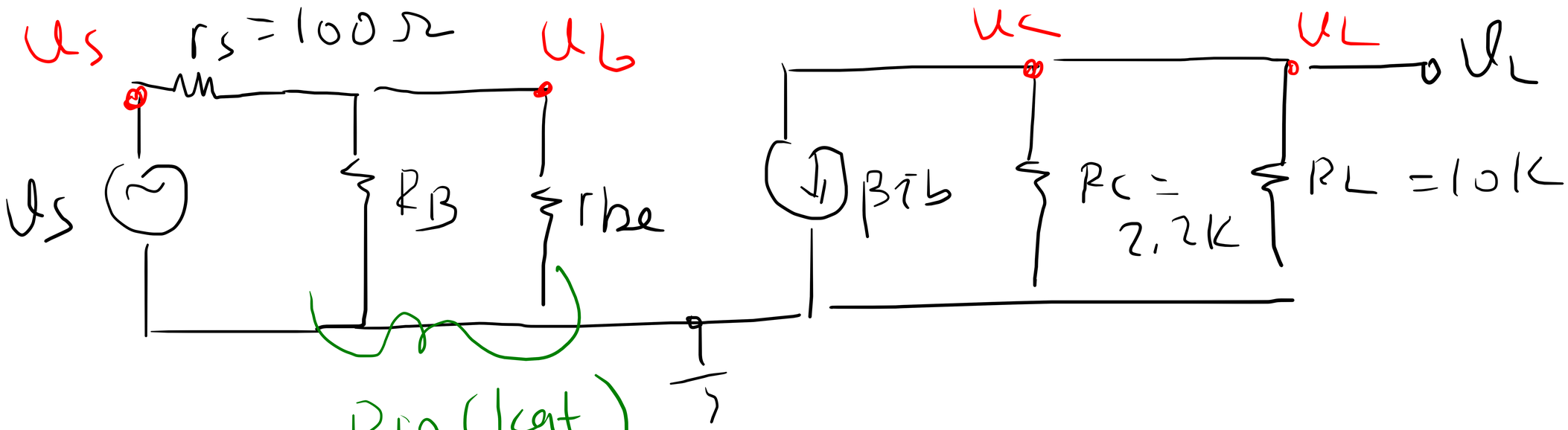

7,108 V
28 mV
uL(t)
us(t)

ÖRNEK 2



$\beta = 100$

$r_e = 20\ \Omega$ iken $\quad \dfrac{U_L}{U_s} = ?$



$R_B = 100K \,||\, 22K$

$R_B = 18,03K$

$r_{be} = (\beta+1)\, re$

$r_{be} = 101 \times 20$

$= 2,02K$

$R_{in(kat)} = R_B // r_{be}$

$= 18K // 2K$

$= 1,8K$

$$A_V = \frac{v_L}{v_S} = \frac{v_b}{v_c} \times \frac{v_c}{v_b} \times \frac{v_b}{v_s}$$

A_0

$$= \left(\frac{10K}{2.2K + 10K}\right) \times \left(-100 \frac{2.2K}{2.02K}\right) \times \left(\frac{1.8K}{100\Omega + 1.8K}\right)$$

A_0

$$= (0,833) \times (-108,91) \times (0,947)$$

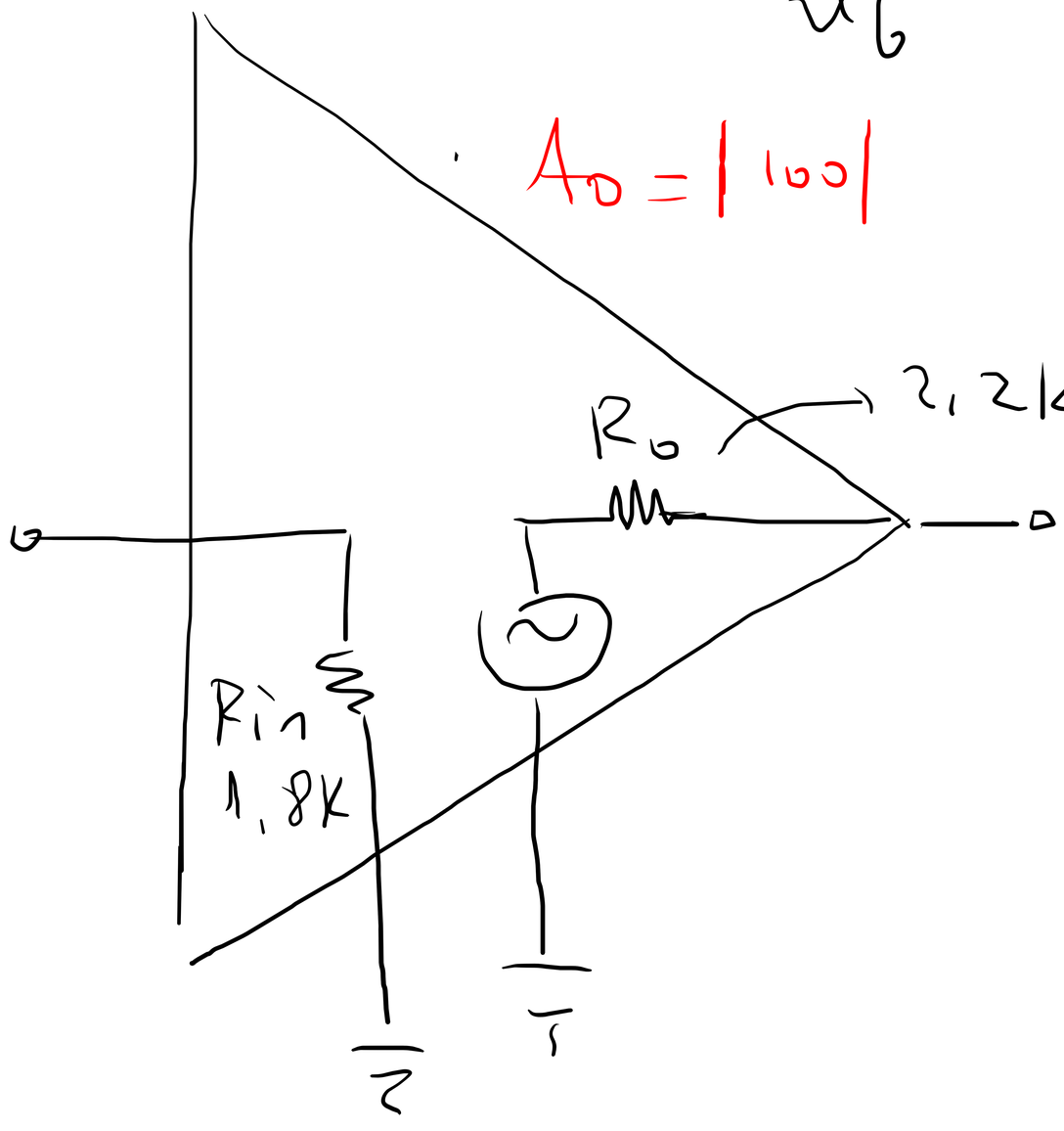
$$= -85,91$$

Rin = ?

Rout = ?

Av = ?

$$\frac{V_c}{V_b} = A_V$$



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