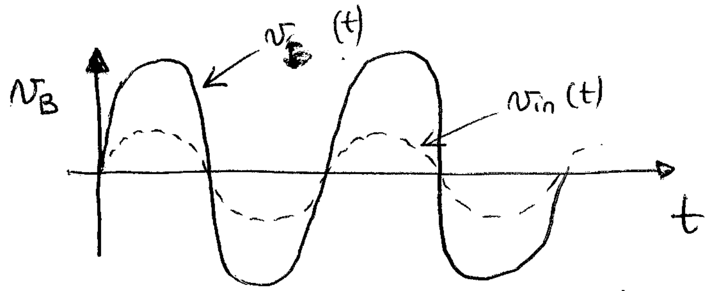
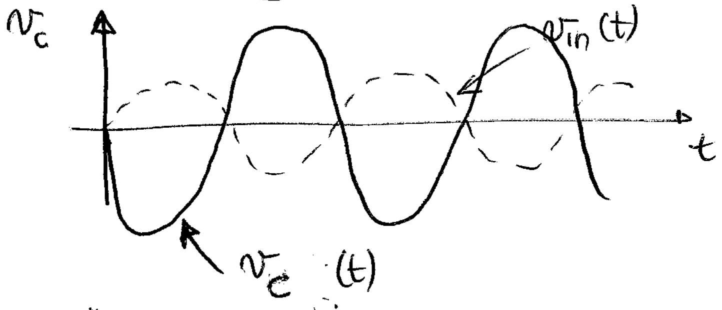
(1) $v_B(t) = v_{in}(t) * \left(1 + \frac{R_2}{R_1}\right) = v_{in}(t) * \left(1 + \frac{15k}{10k}\right) = \frac{5}{2} v_{in}(t)$

$v_C(t) = v_{in}(t) * \left(-\frac{R_2}{R_1}\right) = -1.5\, v_{in}(t)$

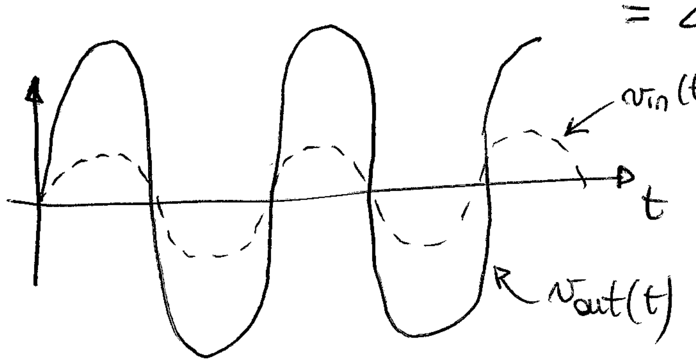




⇓

$v_{out}(t) = v_B(t) - v_C(t) = 2.5\, v_{in}(t) - \left(-1.5\, v_{in}(t)\right) =$

$= 4\, v_{in}(t)$



(2) $G_{ideale} = \left.\frac{v_{out}}{v_{in}}\right|_{ideale} = +4$

Per calcolare Greale devo calcolare Gloop per ciascuno dei due op amp. $A_0 = 90dB = 10^{\frac{90}{20}} = 3$

$G_{loop} = -\frac{R_1}{R_1+R_2} * A_0 = -\frac{10k}{10k+15k} * 3.2\,10^4 = -12'800$

⇓

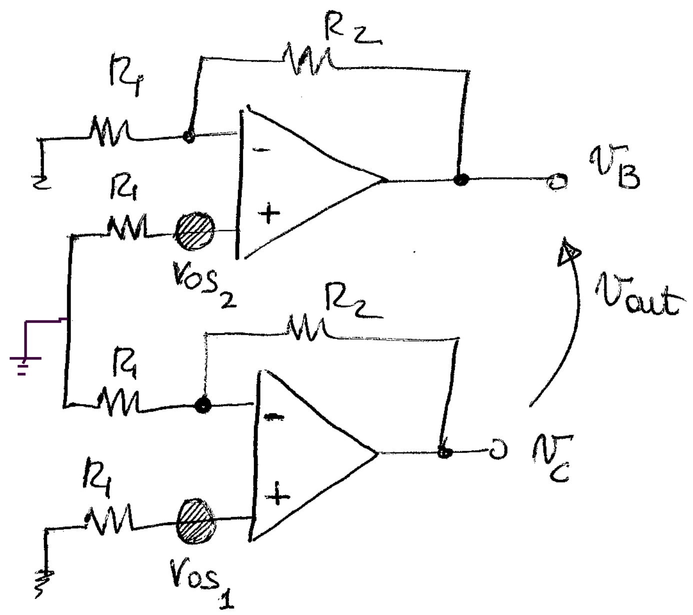
$G_{reale}|_C = \frac{G_{id\,C}}{1 - 1/G_{loop}} = \frac{-1.5}{1 + 1/12800} = -1.4999$

$G_{reale}|_B = \frac{G_{id\,B}}{1 - 1/G_{loop}} = \frac{+2.5}{1 + 1/12800} = 2.4998$

} Greale = 3.999 cioè Gideale perchè Gloop è molto alto.

③ Poichè sia v_B che v_C possono saturare a ±14 V, la massima ampiezza della sinusoide di uscita sarà di 28 V

④



$$v_b = \pm V_{os_2}\left(1+\frac{R_2}{R_1}\right)$$

$$v_c = \pm V_{os_1}\left(1+\frac{R_2}{R_1}\right)$$

$$\Downarrow$$

$$v_{out} = v_b - v_c = \pm V_{os_2}\left(1+\frac{R_2}{R_1}\right) \mp V_{os_1}\left(1+\frac{R_2}{R_1}\right) = \pm 2\cdot 5mV\cdot\left(1+\frac{15k}{10k}\right) = \pm 25mV$$