Circuit 31: Parallel RC

resistor	conductance G	capa.	cap. react.	cap. Susc. B	total adm.
1000 Ω	1 mS	0.22 μF	−1447 Ω	0.7 mS	$1.22\angle 35°$ mS

capacitor current:

$$|i_C| = \frac{5}{1447} = 3.46 \text{ mA} \quad (= 5\text{V} \times 0.7 \text{ mS})$$

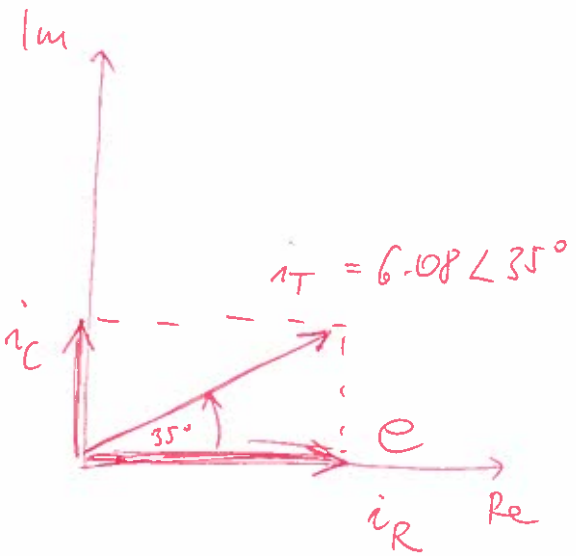
resistor current:

$$|i_R| = \frac{5}{1000} = 5 \text{ mA} \quad (= 5\text{V} \times 1 \text{ mS})$$

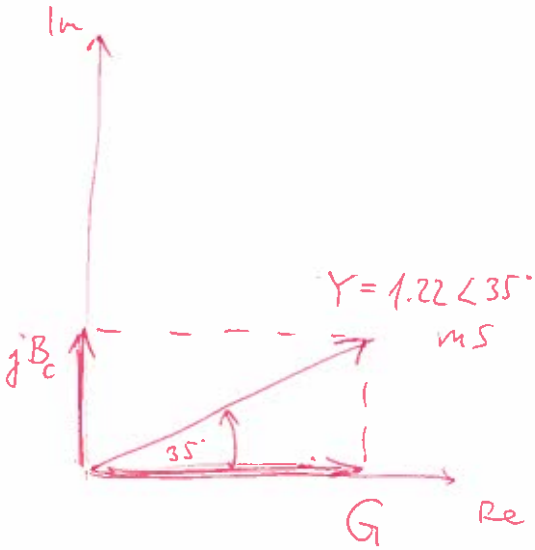
total current:

$$\underline{i_T} = 5 \cdot (1 \text{ mS} + 0.7j \text{ mS}) = 5 + 3.46j \text{ mA} = 6.08\angle 35° \text{ mA}$$

phasor diagram



admittance diagram



Circuit B2 : parallel LC

a) $X_L = \omega L$ $\quad |i'_L| = \frac{e}{X_L}$ For given values $|i'_L| \approx 8\,mA$ (this will be measured)

$L \approx 100\,mH$

b) $i_C = i_e \cdot \frac{Z_L}{Z_L + Z_C} = i_e \cdot \frac{j\omega L}{j\omega L - j\frac{1}{\omega C}} = -0.65 \cdot i_e$ $(+90°$ w.r.t. $e)$

(i_e measured)

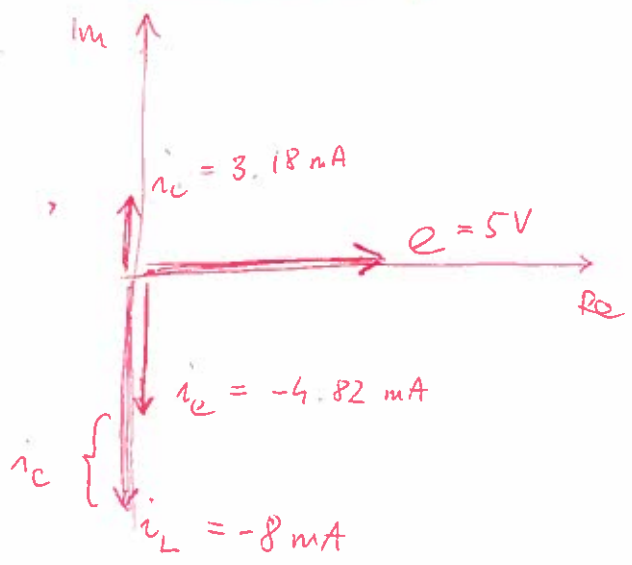
$i'_L = i_e \cdot \frac{Z_C}{Z_C + Z_L} = 1.65 \cdot i_e$

c) V_R is known (measured) $\rightarrow$ $i'_R = \frac{V_R}{10\,\Omega} \equiv i_C$ compare with above

d) $Y = j\omega C - j\frac{1}{\omega L} = -0.964j\,mS$ (neglecting R)

$i_e = \frac{e}{Z} = e \cdot Y = -4.82j\ mA$

Phasor diagram



Admittance diagram