

Exercice 1

$$\underline{Z}_{AB} = \frac{\left(\frac{R}{2}\right) + j\omega L - \frac{R}{2}CL\omega^2}{1 + jR\omega C\left(1 - \frac{1}{2}LC\omega^2\right) - CL\omega^2}$$

$$\underline{Z}_{A'B} = \frac{\frac{R}{2}(1 - \omega^2LC)}{1 + j\omega RC\left(1 - \frac{1}{2}LC\omega^2\right) - \omega^2LC}$$

Exercice 2

$$u_c(t) = 74.7\sqrt{2} \cos(314t - 85.8^\circ) \text{ V}$$

$$i_c(t) = 2.35\sqrt{2} \cos(314t + 4.1^\circ) \text{ A}$$

$$u_R(t) = u_L(t) = 227\sqrt{2} \cos(314t + 19.1^\circ) \text{ V}$$

$$i_L(t) = 0.6\sqrt{2} \cos(314t - 70.9^\circ) \text{ A}$$

$$i_L(t) = 2.27\sqrt{2} \cos(314t + 19.1^\circ) \text{ A}$$

Exercice 3

$$I_1 = 18.53 + 17.24j \text{ mA} = 25.31 \exp(42.93^\circ j) \text{ mA}$$

Exercice 4

$f \text{ (Hz)}$	10	20	1000	10000
$ H $	0.0157	0.04503	0.9332	0.9993

Exercice 5

$$(c) i(t) = \sqrt{2} \cos(20t - 15^\circ) \text{ A}$$

$$(d) Z_{tot} = 21.95 + 2.44j$$

$$(e) \omega_C = \frac{R}{L} = \frac{21.95}{0.122} = 180 \text{ rad/s}$$

Exercice 6

$$(d) K = RC, m = \frac{R}{2} \sqrt{\frac{C}{L}}$$