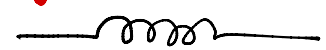
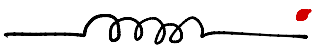
1/ Preference : Dot convention





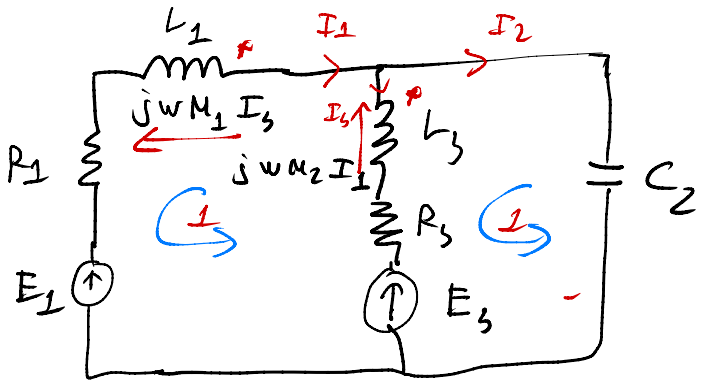
Dot convention

2/ Mutual inductor current

Mutual inductance I_2 from L_1

L_1 : $V_1 = j\omega M_1 I_2$

L_2 : $V_2 = j\omega M_2 I_1$



loop 1 : $i_1 R_1 + i_1 \cdot j\omega L_1 + j\omega L_3 (i_1 - i_2) + R_3 (i_1 - i_2)$

$+ j\omega M_2 I_1 \in j\omega M_1 I_3 = E_1 - E_3$