ECE 580

HOMEWORK 1

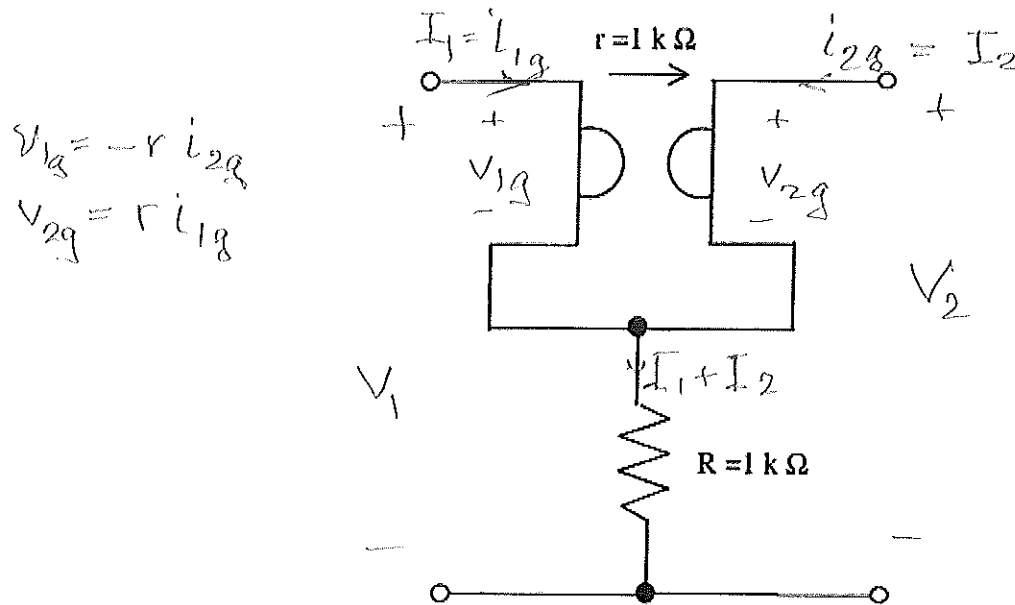# Due Oct. 15, 2015

1. Find the admittance and impedance parameters of a gyrator with gyration resistance R.

$$Y_g = \begin{bmatrix} 0 & 1/r \\ -1/r & 0 \end{bmatrix} \qquad Z_g = \begin{bmatrix} 0 & -r \\ r & 0 \end{bmatrix}$$

2. Find the impedance parameters of the circuit shown below.

$$V_{1g} = -r\, i_{2g}$$
$$V_{2g} = r\, i_{1g}$$

$$V_1 = -r I_2 + R(I_1 + I_2) = R I_1 + (R - r) I_2$$
$$V_2 = r I_1 + R(I_1 + I_2) = (R + r) I_1 + R I_2$$