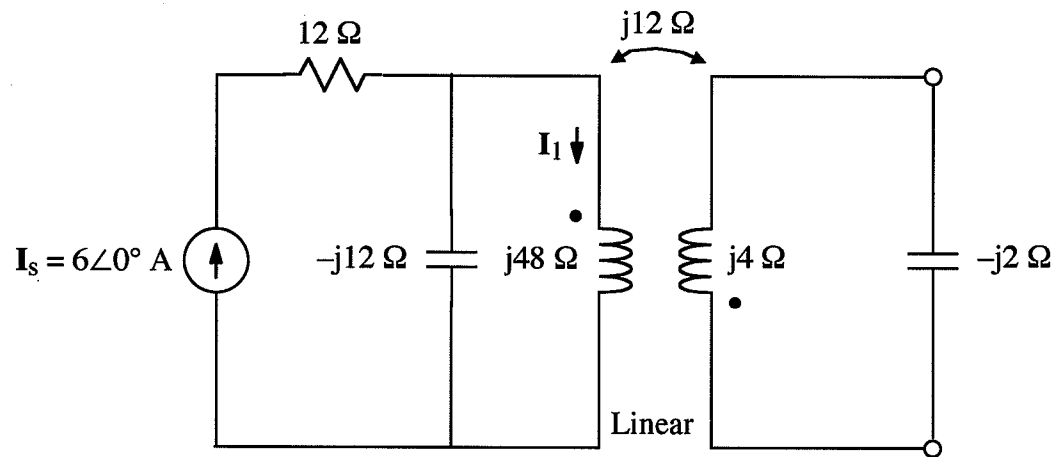
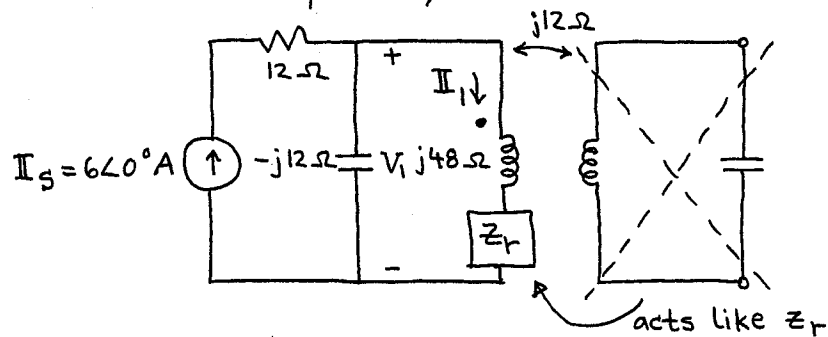


EX:



Calculate the numerical value of phasor current  $I_1$ .

Sol'n: We first replace the secondary with the equivalent reflected impedance,  $Z_r$ , seen on the primary side.



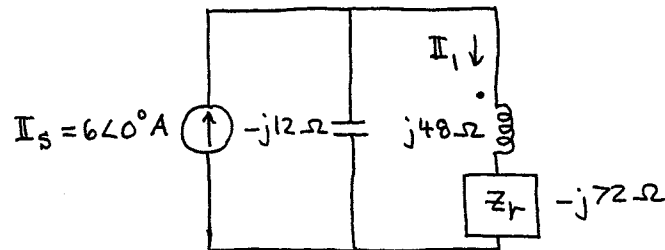
Note:  $V_1$  includes the voltage drop across  $Z_r$ .

We have

$$Z_r = \frac{(\omega M)^2}{Z_{\text{secondary}}} = \frac{12^2 \Omega^2}{j4 - j2 \Omega}$$

$$Z_r = \frac{144 \Omega}{j2} = -j72 \Omega$$

Since the  $12\Omega$  resistor is in series with a current source, it carries the same current as the source and, therefore, may be ignored. We are left with a current divider circuit.



$$I_1 = I_s \cdot \frac{-j12\Omega}{-j12 + j48 - j72\Omega}$$

$$= I_s \frac{-j12}{-j36}$$

$$= \frac{I_s}{3} = \frac{6\angle 0^\circ \text{ A}}{3}$$

$$I_1 = 2\angle 0^\circ \text{ A}$$