**PROBLEM SHEET 9**

**General theorems**

1. **ASSIGNMENT.** Explain in your own words why the superposition theorem and the Thevenin's theorem are not true for non-linear circuits, i.e. containing diodes or transistors. Provide examples.

2. Using the superposition theorem, determine the current in the inductance for a circuit shown in Fig. 1. Assume that the voltage source (1) leads the voltage source (2) by $30^0$.

3. For a circuit on page 5 of the handouts, assume that it is connected to a source of 24 V a.c. with negligible internal resistance, $R_1$ is a capacitor of reactance 14 Ω and $R_4$ is an inductance of reactance 24 Ω. Using complex notations, find the current $I_5$ in the resistor $R_5$ and the voltage $U_{AB}$.
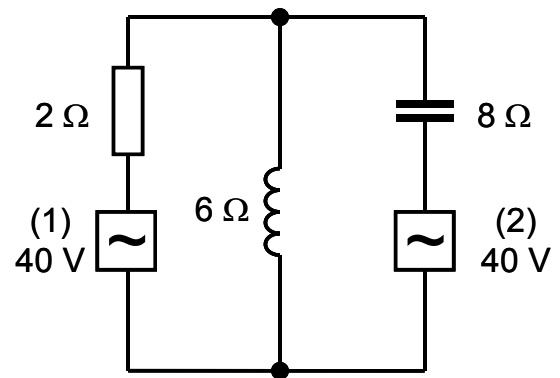
2 Ω    6 Ω    8 Ω

(1)    (2)
40 V    40 V

Figure 1.