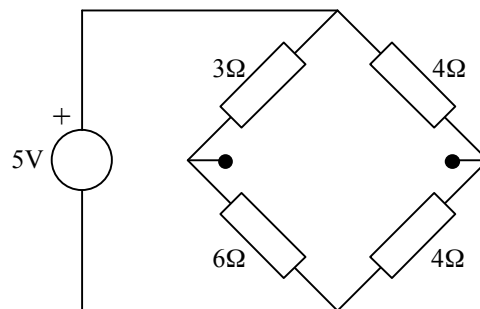
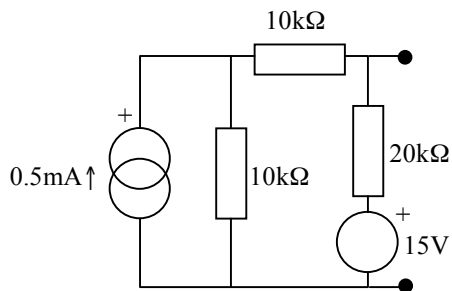
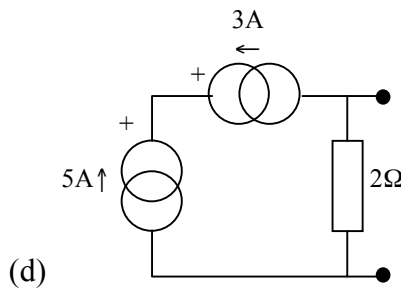
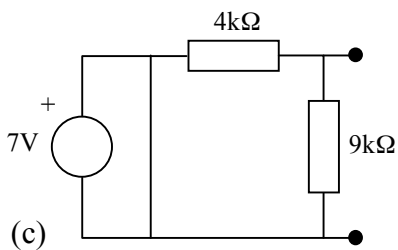
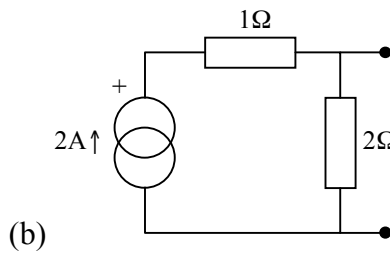
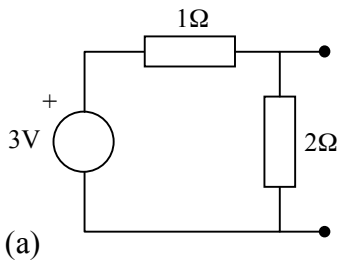


Electronics Classwork 2, 13th January 2005

Dr Mark Neil

You should be able to all of these questions without resorting to a calculator – so why not give it a try!

1. Find the Norton and Thévenin equivalents for the following circuits with respect to the marked terminals. If you feel that some of the circuits don't make sense or will not work then give your reasons why.

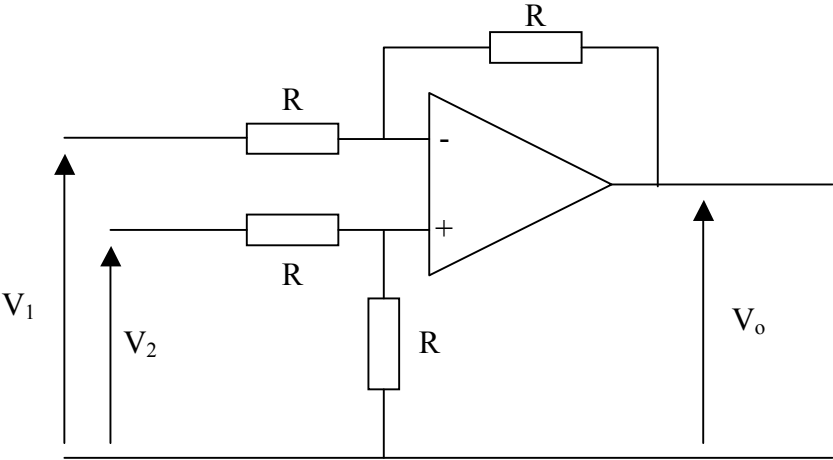


2. If we connect a 1Ω resistor across the terminals of the circuit shown in 1(f) calculate the voltage that we would measure across the 1Ω resistor and the current through it.

3. For the circuit given in 1(e) calculate the current in the top $10k\Omega$ resistor using

- (a) Nodal analysis
- (b) Mesh analysis

3. The figure shows a differential amplifier built using an op-amp and 4 resistors. Show that the output of the amplifier $V_o=A(V_2-V_1)$ and calculate A.



Hint: Use superposition to work out what the circuit does for inputs of V_1 and V_2 in isolation (shorting the other to zero in each case) and remember the virtual earth approximation.