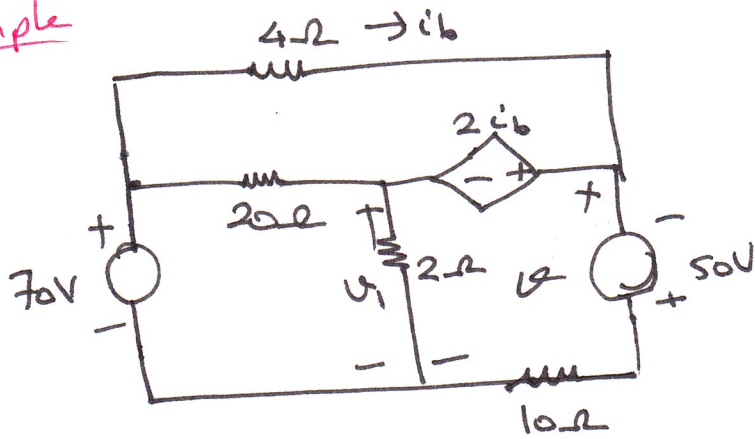


Example



Use the principle of superposition to find the voltage  $v_o$ .

a) (kill 50V source)

$$\frac{v_1'}{10} + \frac{v_1' - 70}{4} + \frac{v_1' - 70}{20} + \frac{v_1'}{2} = 0$$

$$i_b' = \frac{70 - v_1'}{4}, \quad v_1' + 2i_b' = v_1'$$

Therefore  $v_1' = \frac{805}{23.5} = 34.26$

b)  $\frac{v_1''}{2} + \frac{v_1''}{20} + \frac{v_1''}{4} + \frac{v_1'' + 50}{10} = 0$

$$v_1'' = v_1'' + 2i_b'', \quad i_b'' = -\frac{v_1''}{4}$$

$$v_1'' = \frac{-100}{23.5} = -4.26 \text{ V}$$

$$v_o = v_1' + v_1'' = 34.26 - 4.26 = 30 \text{ V} //$$