Question 2

What is the value of i_b in Figure 2? Find the value of resistance R that gives rise to a magnitude of 6V being measured by the voltmeter in the same figure.

(10 marks)

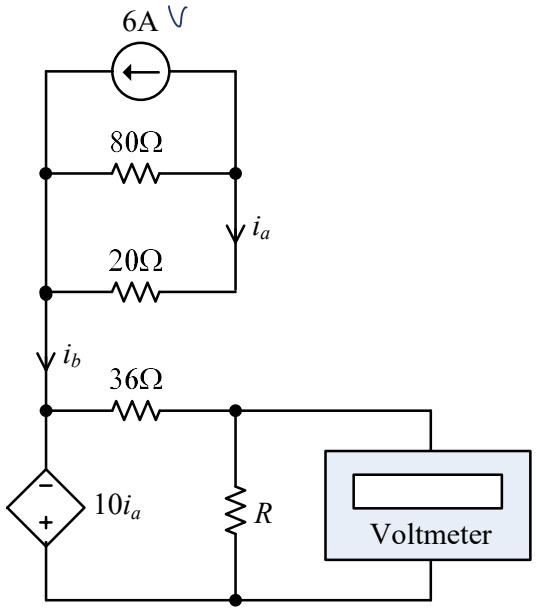
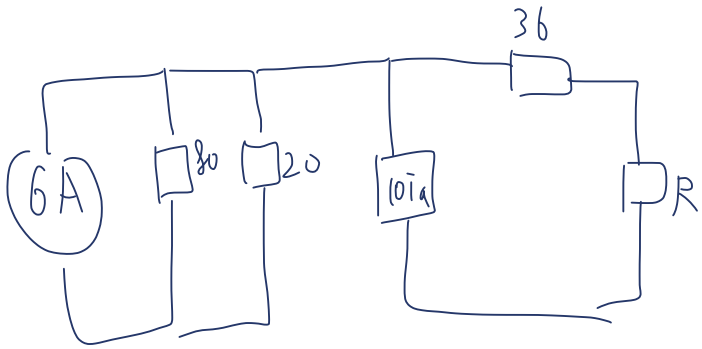
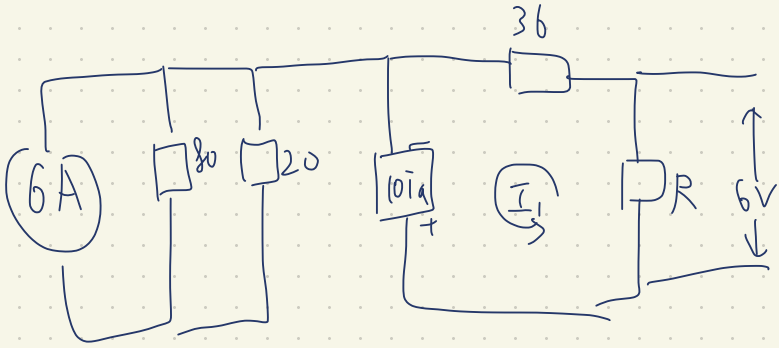


Figure 2



For i_a, $i_a = 6A \cdot \frac{80}{80+20} = -4.8A$

$\therefore$ voltage source is $10i_a = -48V$



By KVL

$6V - 36i_1 + (-48)I_1 = 0$

$\therefore i_1 = 0.107142857$

where $i_b = i_1 = 0.107143\ A$ //

For I_1, $R = 6$

$R = 84\Omega$ //

∴ Required Resistance is 84Ω