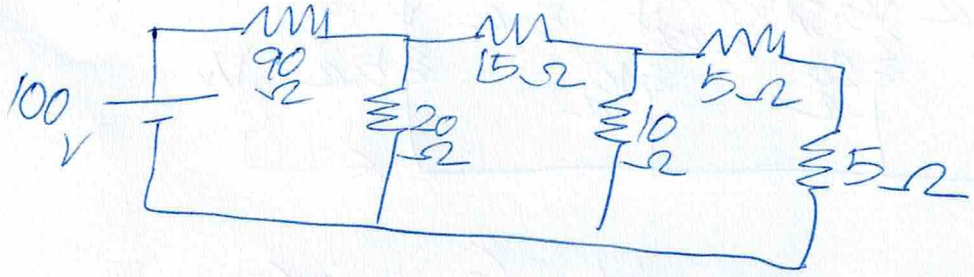
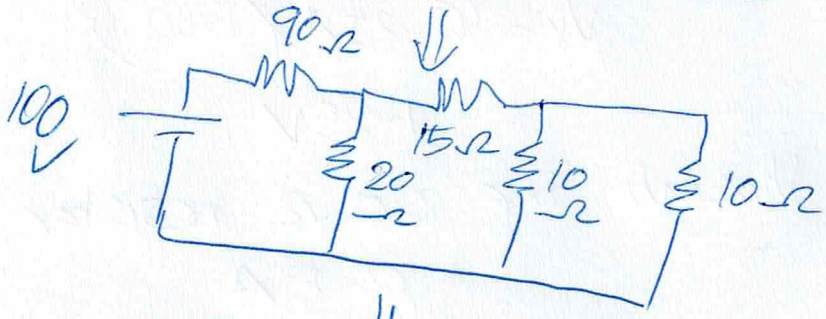
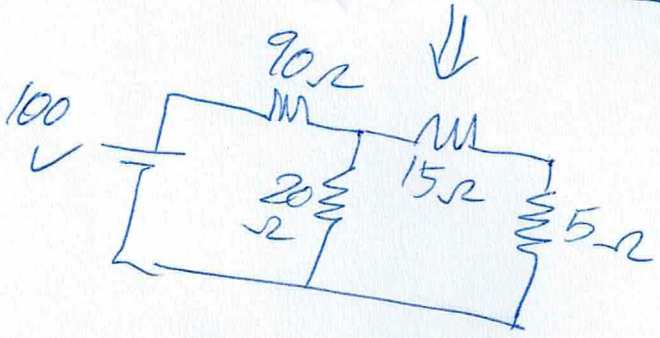
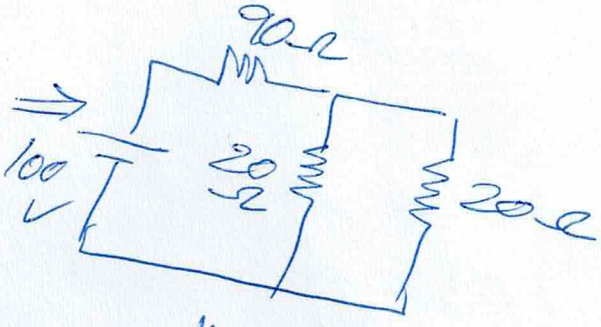
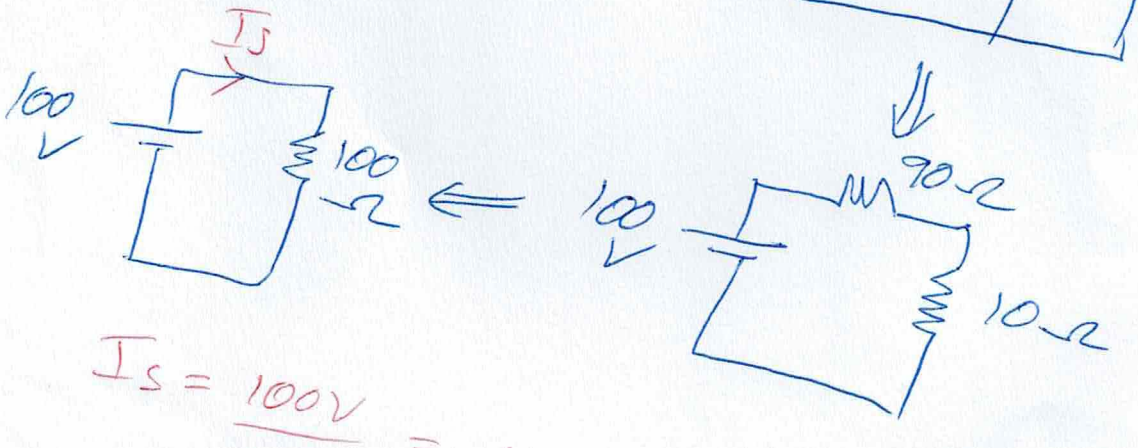
Take-home tutorial 4 Q2



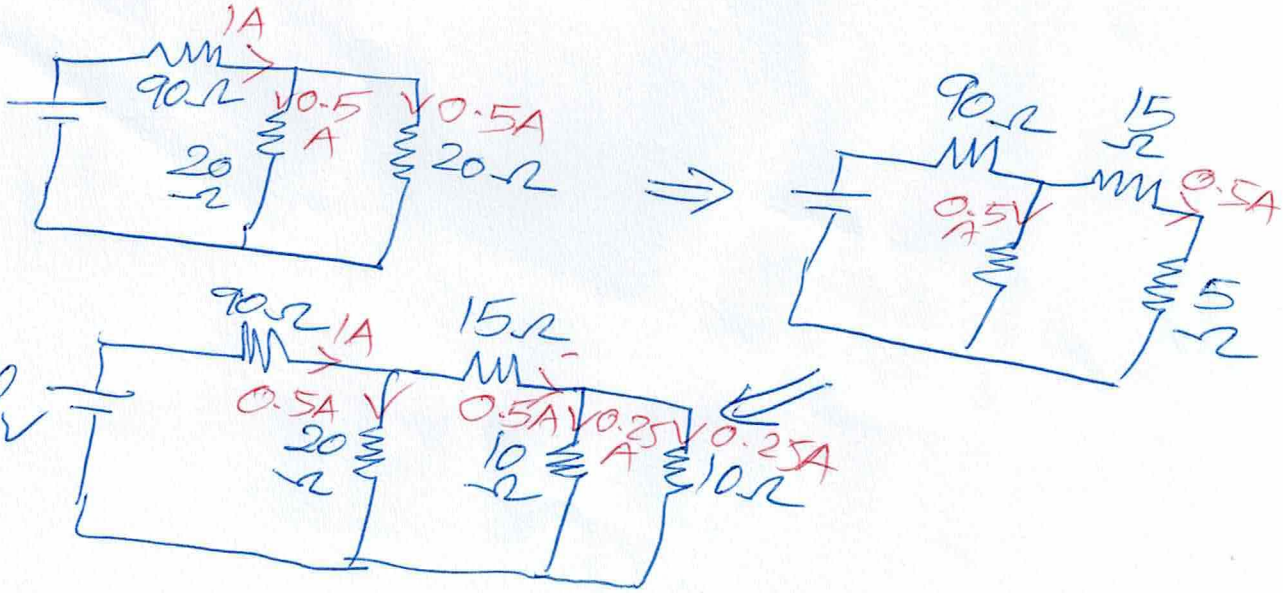


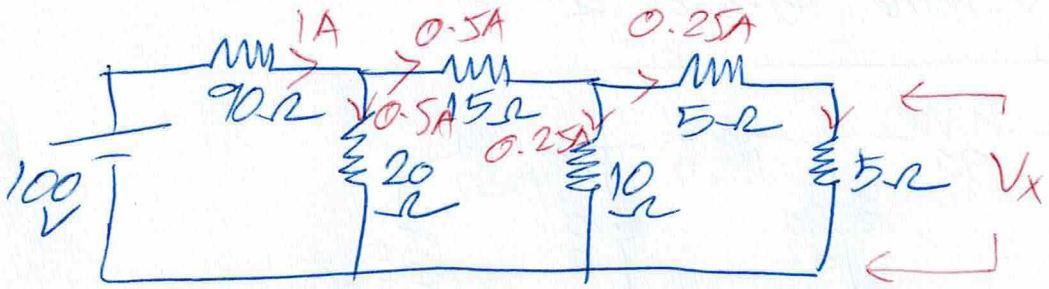






$$I_S = \frac{100\,V}{100\,\Omega} = 1\,A$$





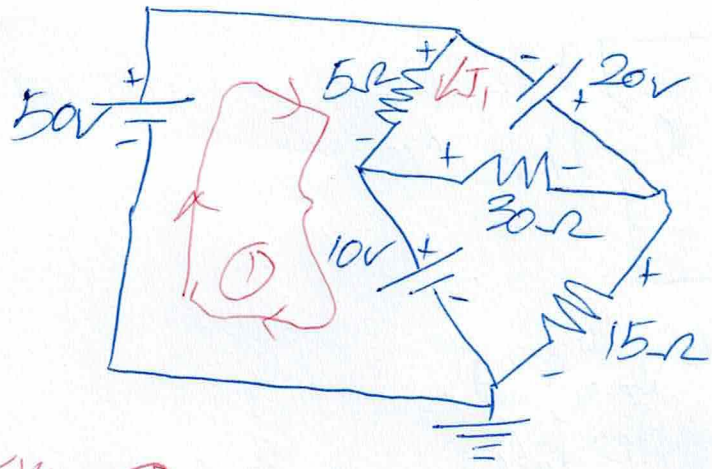
$V_X = (0.25A)(5\Omega)$

$= 1.25V$

Current through the 20Ω resistor

$= 0.5A$

Take-home tutorial 4 question 5



KVL (1)

$$-50 + I_1(5) + 10 = 0$$

$$I_1 = \frac{40}{5} = 8A$$

(KVL)

$$-50 - 20 + V_{15\Omega} = 0$$

$$-70 + V_{15\Omega} = 0$$

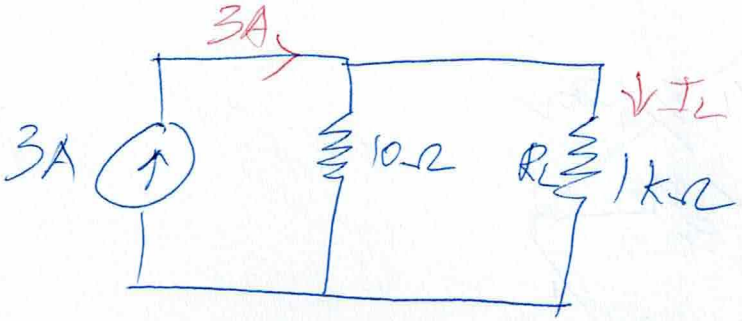
$$V_{15\Omega} = 70V$$

$$I_{(15\Omega)} = \frac{70V}{15\Omega} = 4.67A$$

$$P_{(15\Omega)} = \frac{V^2}{R} = \frac{70^2}{15} = \frac{4900}{15} = 326.7$$

Watt

Take-home tutorial 4 Quest. 10



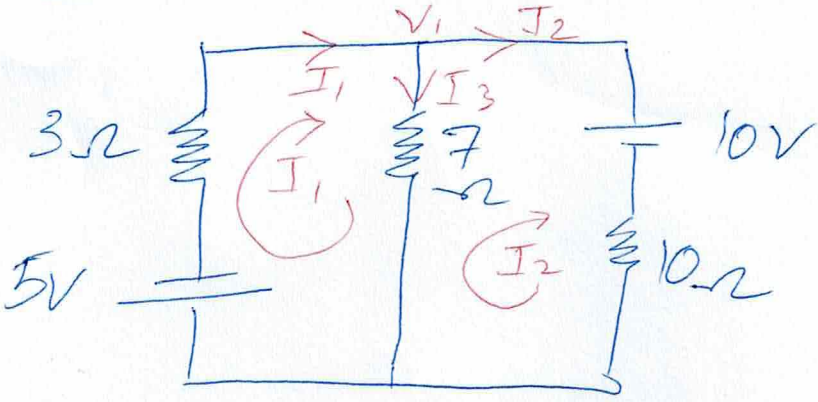
Current Divider theory

$$I_L = \frac{10\Omega}{10\Omega + 1k\Omega} \times 3A$$

$$I_L = 0.0297\,A$$

$$I_L = 29.7\,mA$$

Take-home tutorial 4 question 16



At node V_1

$$I_1 = I_3 + I_2$$

$$\frac{0 - 5 - V_1}{3} = \frac{V_1}{7} + \frac{V_1 - 10}{10}$$

(x210)

$$-70V_1 - 350 = 30V_1 + 21V_1 - 210$$

$$121V_1 = -140$$

$$V_1 = -1.157$$

$$V_{(3\Omega)} = V_1 - (-5) = -1.157 + 5$$

$$V_{(3\Omega)} = +3.84\ V$$

$$V_{(7\Omega)} = V_1 = -1.157\ V$$

$$V_{(10\Omega)} = V_1 - 10V$$

$$= -1.157 - 10$$

$$V_{(10\Omega)} = -11.157\ V$$