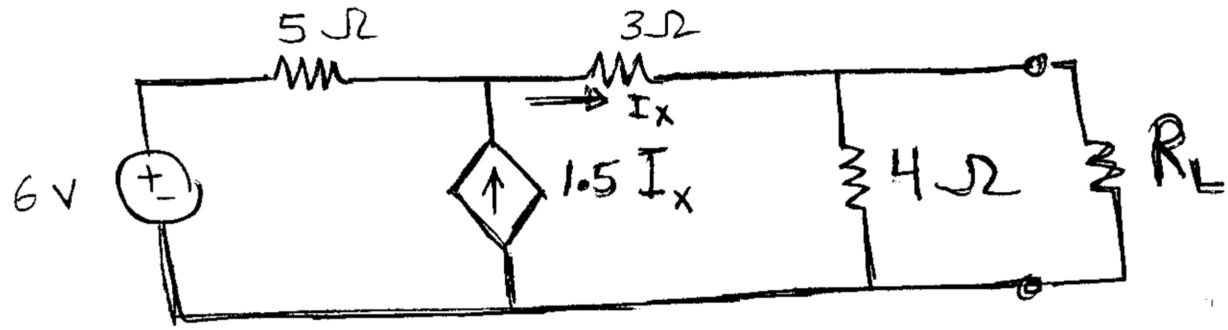
EE 201-06 – Winter 2012(112)
Quiz 3

SER	ID	NAME

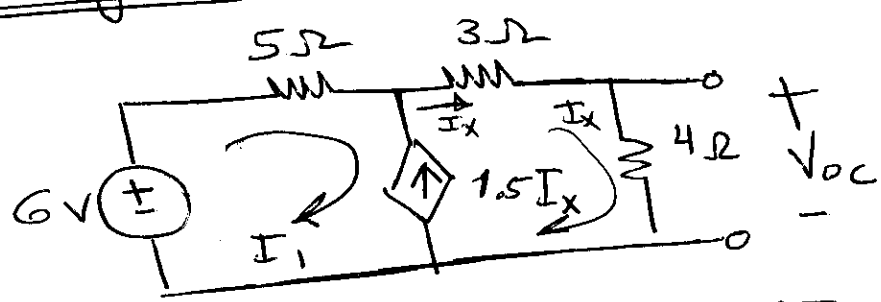


For the circuit shown above, find the maximum power absorbed by the load resistor R_L ?

Remove the load Resistor R_L and find Theveinen equivlent

~~Rember~~ Remeber Maximum power ⇒ Finding Thevinen

① Finding V_{oc}



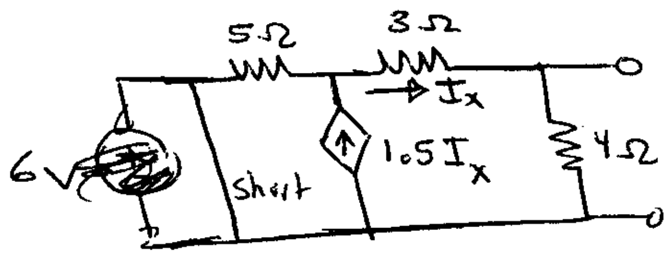
supper mesh $-6 + 5I_1 + (3+4)I_x = 0 \Rightarrow 5I_1 + 7I_x = 6$ — ①

$I_x - I_1 = 1.5 I_x \Rightarrow I_1 = -0.5 I_x$ — ②

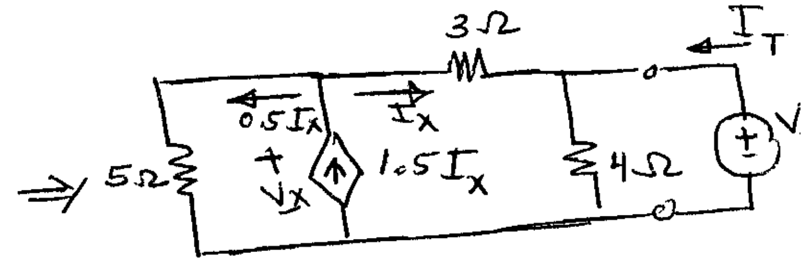
② → ① $5(-0.5 I_x) + 7 I_x = 6 \Rightarrow I_x = 1.33$ A

$\Rightarrow V_{oc} = 4 I_x = 5.33$ V

② Finding R_{th}



⇒



$$R_{th} = \frac{V_T}{I_T}$$ ⇒ find an equation (or a realtion between V_T and I_T

$$I_T = \frac{V_T}{4} - I_x \quad — ①$$

Now we want a realtion or an equation between I_x and I_T or V_T and substitute it in ①

$$V_x = 5(0.5 I_x) = 2.5 I_x$$

(same volt on the 5Ω)

KVL $\quad -V_x + 3I_x + V_T = 0 \Rightarrow -2.5 I_x + 3I_x + V_T = 0$

$$\Rightarrow I_x = -2V_T \quad — ②$$

$$② \rightarrow ① \Rightarrow I_T = \frac{V_T}{4} - (-2V_T)$$

$$\Rightarrow \frac{V_T}{I_T} = \frac{4}{9} = R_{th}$$

P $\quad V^2 \quad 5.33^2 \quad$ = **15.98 W**