ECE 3 HW 3

Lawrence Liu

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For the open circuit, let the voltage at the node be V, we have

$$V = \frac{3I_x - V}{2} + I_x$$

and

$$I_x = \frac{10 - V}{5}$$

Solving these we get $I_x = 1.5A$, therefore we would have that $V_{th} = 10 - 3I_x = \boxed{5.5V}$

Now we attach a resistor with resistance R across the nodes, then we would still have

$$V = \frac{3I_x - V}{2} + I_x$$

and

$$I_x = \frac{10 - V}{5}$$

and thus we would have $I_x = 1.5A$

therefore the current flowing across the reistor is $I_R = \frac{10 - 3Ix}{R}$

Therefore we have

$$I_{sc} = \lim_{R \to 0} I_R = \infty$$

Therefore we have

$$R_{eq} = \frac{V_{th}}{I_{sc}} = \boxed{0}$$