

Thevenin Equivalent

Electrical Engineering

Any linear two-terminal network as one source and one series resistance.

Seen from two terminals, any linear network behaves as V_{Th} in series with R_{Th} .

$$V_{Th} = \text{open-circuit voltage} \cdot R_{Th} = V_{oc} / I_{sc}$$

V_{oc} measured 12 V

Load removed.

$V_{Th} = 12 \text{ V}$

I_{sc} measured 40 mA

$12 \div 0.04$.

$R_{Th} = 300 \Omega$

Load of 300Ω

Half of V_{Th} .

6 V across it

THE COMMON MISTAKE

✗ **Zeroing dependent sources to find R_{Th}**

✓ **Zeroing only the independent sources**

A dependent source is part of how the network behaves. Kill it and you have found the resistance of some other circuit.

Zeroing means shorting a voltage source and opening a current source — not deleting the component from the drawing.