EECS 16A CSM Presentation

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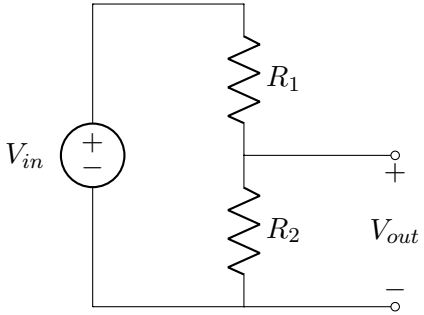
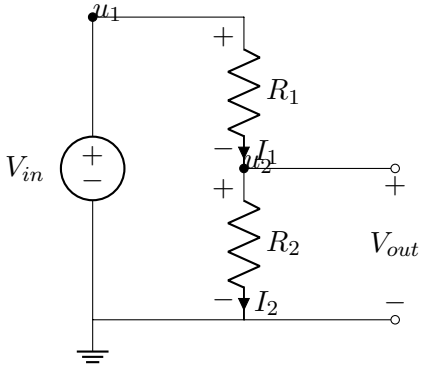
The Voltage Divider



Derivation

Labeling



Derivation (cont.)

Node Voltage Analysis

$$u_1 = V_{in} \tag{1}$$

$$u_2 = V_{out} \tag{2}$$

$$\frac{u_2}{R_2} - \frac{u_1 - u_2}{R_1} = 0 \tag{3}$$

$$\Rightarrow u_1 \left(-\frac{1}{R_1} \right) + u_2 \left(\frac{1}{R_1} + \frac{1}{R_2} \right) = 0 \tag{4}$$

$$V_{out} \left(\frac{R_1 + R_2}{R_1 R_2} \right) = V_{in} \left(\frac{1}{R_1} \right) \tag{5}$$

$$V_{out} = \frac{R_2}{R_1 + R_2} V_{in} \tag{6}$$

Demo

http://tinyurl.com/y2rqf523