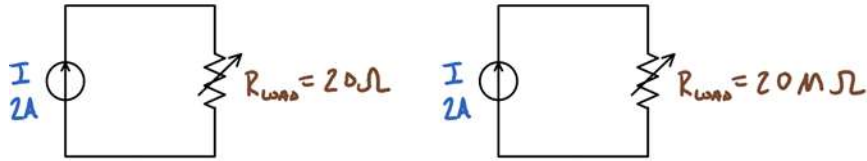


## DC Current Sources

Describe a current source. Draw the schematic symbol.

Calculate the voltage necessary to push the indicated amount of current through the given loads.



Use the current divider rule and Kirchoff's Current Law to solve for the current through each element. Determine the voltage drop across each element.

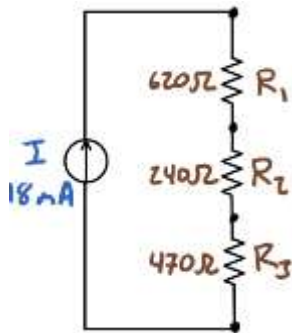


Use the current divider rule and Kirchoff's Current Law to solve for the current through each element. Determine the voltage drop across each element.



Given this series circuit including a current source determine the voltage drop across each element. Additionally, determine the voltage rise induced by the current source.

ERROR at 6:34  $V_1 = 11.2V$ , current source voltage =  $11.2 + 4.3 + 8.5 = 24V$



Identify two rules regarding current sources. Use these rules to determine the current through and voltage across the load resistor.



Explain the operation of a real-world current source.

Explain a closed loop controller.

Given an  $80\text{mA}$  current source establishing a  $31.2\text{V}$  differential across a  $390\Omega$  load resistor determine the error.

Given an  $80\text{mA}$  current source establishing a  $31.2\text{V}$  differential across a  $470\Omega$  load resistor determine the error. Determine the necessary voltage to return the error signal to 0.

Given an  $80\text{mA}$  current source establishing a  $37.6\text{V}$  differential across a  $180\Omega$  load resistor determine the error. Determine the necessary voltage to return the error signal to 0.

Given an  $80\text{mA}$  current source establishing a  $14.4\text{V}$  differential across a  $2\text{k}\Omega$  load resistor determine the error. Determine the necessary voltage to return the error signal to 0. Determine the output and error if the maximum voltage across the current source is  $120\text{V}$ .