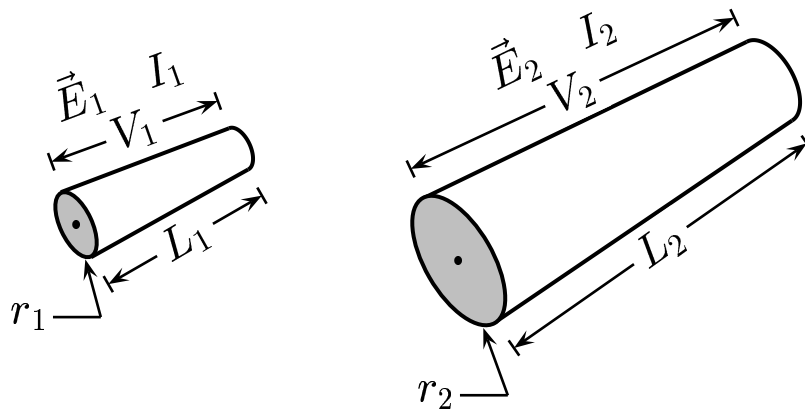


Given :  $A = \pi r^2$ ,  $\rho_2 = \rho_1$ ,  $A_2 = 2 A_1$ ,  $L_2 = 2 L_1$ , and  $V_2 = V_1$ .



Find the ratio  $\frac{I_2}{I_1}$  of the currents in the conductors.

- A)  $\frac{I_2}{I_1} = 2$ .
- B)  $\frac{I_2}{I_1} = 1$ .
- C)  $\frac{I_2}{I_1} = \frac{1}{2}$ .

Using Ohm's law, we have

$$\frac{I_2}{I_1} = \frac{\left(\frac{V_2}{R_2}\right)}{\left(\frac{V_1}{R_1}\right)} = \frac{R_1}{R_2}$$

$$= \frac{\rho \left(\frac{L_2}{A_2}\right)}{\rho \left(\frac{L_1}{A_1}\right)} = \frac{\left(\frac{L_1}{L_2}\right)}{\left(\frac{A_1}{A_2}\right)} = 1.$$

Answer **B**.

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