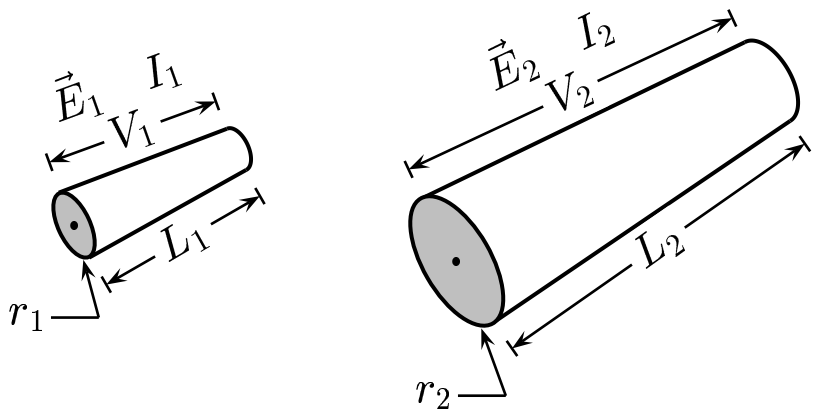
Given : $A = \pi\, r^2\,,\quad \rho_2 = \rho_1\,,\quad A_2 = 2\,A_1\,,\quad L_2 = 2\,L_1\,,\quad$ and $\quad V_2 = V_1\,.$



Find the ratio $\dfrac{E_2}{E_1}$ of the electric field in the conductors.

A) $\dfrac{E_2}{E_1} = 2\,.$

B) $\dfrac{E_2}{E_1} = 1\,.$

C) $\dfrac{E_2}{E_1} = \dfrac{1}{2}\,.$

Using Ohm's law, we have

$$\frac{E_2}{E_1} = \frac{\left(\frac{V_2}{L_2}\right)}{\left(\frac{V_1}{L_1}\right)}$$

$$= \frac{L_1}{L_2}$$

$$= \frac{1}{2}$$

Answer **C**.

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