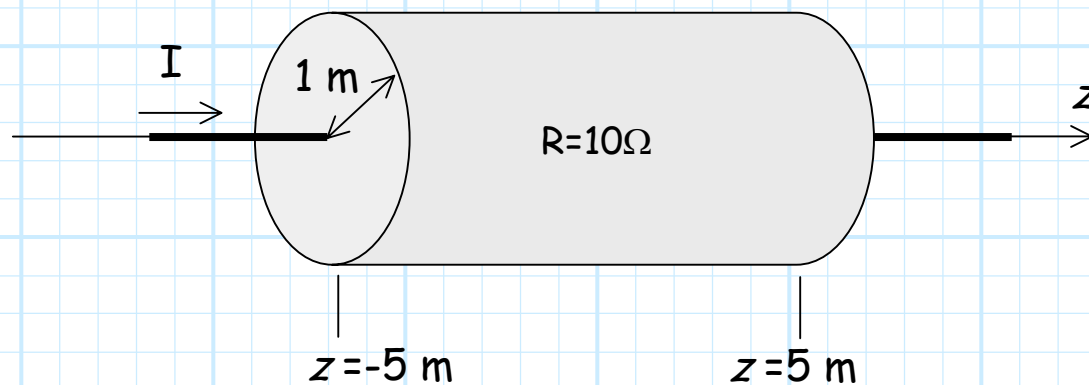


### Special Problem 8-3.6

A  $10\ \Omega$  resistor with length 10 and radius 1 is aligned with the  $z$ -axis.

Within this resistor exists the magnetic field:

$$\mathbf{H}(\vec{r}) = \frac{4}{\pi} \rho^4 \hat{a}_\phi \quad [A/m]$$



1. Determine the current  $I$  through this resistor.
2. If the electric potential at  $z = -5$  is  $20\ \text{V}$ , determine the electric potential at  $z = 5$ .