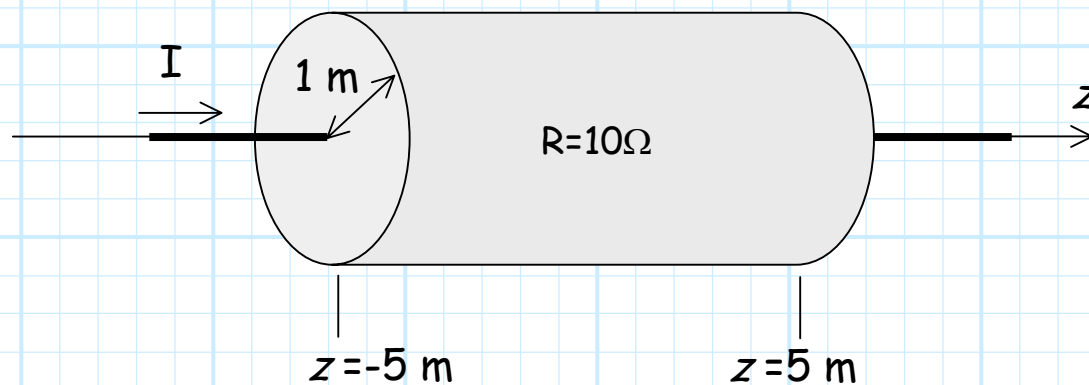**Special Problem 8-3.6**

A 10 Ω **resistor** with **length** 10 and **radius** 1 is aligned with the z-axis.

Within this resistor exists the magnetic field:

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

1. Determine the current I through this resistor.

2. If the electric potential at $z=-5$ is 20 V, determine the electric potential at $z=5$.