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:

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

1. Determine the current I through this resistor.

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