

### Special Problem 5-2.2

A resistor with length 6 and radius 1 is centered at the origin and aligned with the z-axis.

This cylinder is made of material with conductivity:

$$\sigma = \frac{3}{\pi(1+3z^2)} \left[ \frac{1}{\Omega \cdot m} \right]$$

Say **current** is flowing in this resistor with a density:

$$\mathbf{J}(\bar{r}) = 3\hat{a}_z \left[ \text{Amps} / m^2 \right]$$

Determine the **resistance** of this cylinder (Hint: it has a **numerical** value!).

