PHYS 212 Current and current density Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Define electric current, express its unit, and identify it as a vector or scalar.

2. Define current density, express its unit, and identify it as a vector or scalar.

3. The figure shows a portion of a circuit. What is the current *i* in the lower right-hand wire?



4. The magnitude *J* of the current density in a certain wire with a circular cross section of radius *R* = 4.0 mm is given by *J* = (3 × 108)*r*2, with *J* in amperes per square meter and radial distance *r* in meters. What is the current through the wire?

 