60. (a) The magnitude of the current density vector is

$$\begin{aligned} J_A = J_B &= \frac{i}{A} = \frac{V}{(R_1+R_2)A} = \frac{4\,\text{V}}{(R_1+R_2)\pi D^2} \\ &= \frac{4(60.0\,\text{V})}{\pi(0.127\,\Omega+0.729\,\Omega)(2.60\times10^{-3}\,\text{m})^2} \\ &= 1.32\times10^7\ \text{A/m}^2\ . \end{aligned}$$

(b) $V_A = VR_1/(R_1+R_2) = (60.0\,\text{V})(0.127\,\Omega)/(0.127\,\Omega+0.729\,\Omega) = 8.90\,\text{V}$, and $V_B = V - V_A = 60.0\,\text{V} - 8.9\,\text{V} = 51.1\,\text{V}$.

(c) Calculate the resistivity from $R = \rho L/A$ for both materials: $\rho_A = R_A A/L_A = \pi R_A D^2/4L_A = \pi(0.127\,\Omega)(2.60\times10^{-3}\,\text{m})^2/[4(40.0\,\text{m})] = 1.69\times10^{-8}\,\Omega\cdot\text{m}$. So A is made of copper. Similarly we find $\rho_B = 9.68\times10^{-8}\,\Omega\cdot\text{m}$, so B is made of iron.