

59. **REASONING AND SOLUTION** Let the current in the left-hand wire be labeled  $I_1$  and that in the right-hand wire  $I_2$ .

a. At point  $A$ :  $B_1$  is *up* and  $B_2$  is *down*, so we subtract them to get the net field. We have

$$B_1 = \mu_0 I_1 / (2\pi d_1) = \mu_0 (8.0 \text{ A}) / [2\pi (0.030 \text{ m})]$$

$$B_2 = \mu_0 I_2 / (2\pi d_2) = \mu_0 (8.0 \text{ A}) / [2\pi (0.150 \text{ m})]$$

So the net field at point  $A$  is

$$B_A = B_1 - B_2 = \boxed{4.3 \times 10^{-5} \text{ T}}$$

b. At point  $B$ :  $B_1$  and  $B_2$  are both *down* so we add the two. We have

$$B_1 = \mu_0 (8.0 \text{ A}) / [2\pi (0.060 \text{ m})]$$

$$B_2 = \mu_0 (8.0 \text{ A}) / [2\pi (0.060 \text{ m})]$$

So the net field at point  $B$  is

$$B_B = B_1 + B_2 = \boxed{5.3 \times 10^{-5} \text{ T}}$$