32.54. **Model:** Assume that the wire is infinitely long.

Visualize: Please refer to Figure P32.54. The wire, looped as it is, consists of a circular part and a linear part.

Solve: Using Equation 32.7 and Example 32.3, the magnetic field at P is

$$B_P = B_{loop\ center} + B_{wire} = \frac{\mu_0 I}{2R} + \frac{\mu_0 I}{2\pi R}$$

$$= \frac{4\pi(10^{-7}\ \text{T m / A})(5.0\ \text{A})}{2(0.01\ \text{m})} + \frac{4\pi(10^{-7}\ \text{T m / A})(5.0\ \text{A})}{2\pi(0.01\ \text{m})} = 4.1 \times 10^{-4}\ \text{T}$$