32.21. **Visualize:**   Please refer to Figure Ex32.21.

Solve: Because $\vec{B}$ is in the same direction as the integration path $\vec{s}$ from i to f, the dot product of $\vec{B}$ and $d\vec{s}$ is simply Bds. Hence the line integral

$$\int_i^f \vec{B} \cdot d\vec{s} = \int_i^f Bds = B\int_i^f ds = B\left(\sqrt{(0.50 \text{ m})^2 + (0.50 \text{ m})^2} \right) = (0.10 \text{ T})\sqrt{2}(0.50 \text{ m}) = 0.0707 \text{ T m}$$