

Consider a wire with a resistance per unit length of $1\Omega/cm$ bent into a rectangular loop and placed into the yz-plane as shown. The magnetic field in the entire region is uniform and increases from zero as follows: $\mathbf{B} = (2\hat{\mathbf{i}} + 1\hat{\mathbf{j}} + 3\hat{\mathbf{k}})tT/s$, where t is the time in seconds.

(a) Find the magnetic flux Φ_B through the rectangle at time t = 2s.

(b) Find magnitude and direction (cw/ccw) of the induced EMF \mathcal{E} around the rectangle at time t = 2s.





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