Example Problem
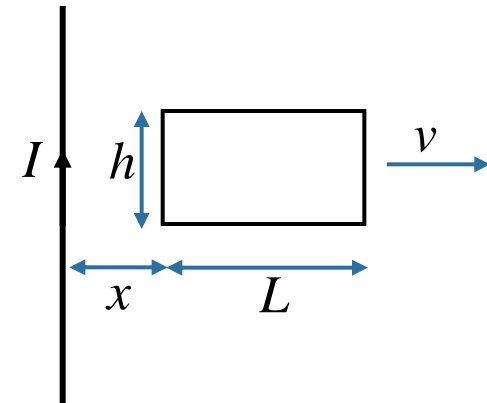
A rectangular loop $(h = 0.3m\ L = 1.2\ m)$ with total resistance of 5Ω is moving away from a long straight wire carrying total current $8\ \text{amps}$. What is the induced current in the loop when it is a distance $x = 0.7\ m$ from the wire?

Conceptual Analysis:

Long straight current creates magnetic field in region of the loop.

Vertical sides develop *emf* due to motion through B field

Net *emf* produces current

Strategic Analysis:

Calculate B field due to wire.

Calculate motional *emf* for each segment

Use net *emf* and Ohm's law to get current