R. Knight 34.53

A slide wire of length L, mass m, and resistance R slides down a U-shaped metal track that is tilted upward at an angle theta. The track has zero resistance and no friction. A vertical magnetic field B fills the loop formed by the track and the slide wire.

a. Find an expression for the induced current when the slide wire moves at speed v.
b. Show that the slide wire reaches a terminal speed v_t, and find an expression for v_t.