

106. (First problem of **Cluster**)

Combining Ohm's and Faraday's laws, the current magnitude is

$$i = \frac{|\mathcal{E}|}{R} = \frac{BLv}{R}$$

for this “one-loop” circuit, where the version of Faraday's law expressed in Eq. 31-10 (often called “motional emf”) has been used. Here, $B = |\vec{B}| = 0.200$ T, $L = 0.300$ m and $v = 12.0$ m/s. Reasoning with Lenz's law, the sense of the induced current is *counterclockwise* (to produce field in its interior out of the page, “fighting” the increasing inward pointed flux due to the applied field).

(a) With $R = 5.00\ \Omega$, this yields $i = 0.144$ A.

(b) With $R = 7.00\ \Omega$, we obtain $i = 0.103$ A.