

28. Noting that $F_{\text{net}} = BiL - mg = 0$, we solve for the current:

$$i = \frac{mg}{BL} = \frac{|\mathcal{E}|}{R} = \frac{1}{R} \left| \frac{d\Phi_B}{dt} \right| = \frac{B}{R} \left| \frac{dA}{dt} \right| = \frac{Bv_t L}{R},$$

which yields $v_t = mgR/B^2L^2$.