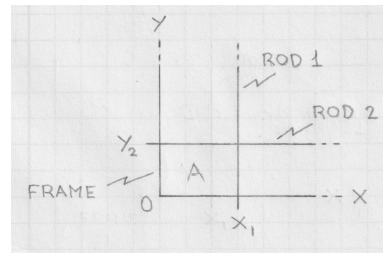# [lex81] Motional EMF I

Consider a fixed L-shaped metal frame and two mobile metal rods, which in combination form a rectangular conducting loop of variable size, positioned in a uniform and constant magnetic field $B = 0.79\text{mT}$ perpendicular to the plane of the loop.

Scenario (i): rod 2 stays fixed at $y_2 = 2.5\text{m}$ and rod 1 moves with its instantaneous position at $x_1(t) = (1.3\text{m/s})t$.

Scenario (ii): rod 1 stays fixed at $x_1 = 3.5\text{m}$ and rod 2 moves with its instantaneous position at $y_2(t) = (1.7\text{m/s})t$.

Scenario (iii): both rods move with rod 1 at position $x_1(t) = (1.3\text{m/s})t$ and rod 2 at position $y_2(t) = (1.7\text{m/s})t$.

For each scenario, find, at time $t = 2\text{s}$, the area A of the loop, the magnetic flux $|\Phi_B|$ through the loop, and the induced EMF $|\mathcal{E}|$ around the loop (only magnitudes, no directions, no minus signs).

Solution: