Three very long wires are arranged in the configuration shown. The two lower wires are fixed in position and carry identical currents out of the paper. The upper wire has a mass density of 2.5¢ kg/m. It has the same current as the lower wires, but in the opposite direction. Calculate the magnitude of the current I that will support the upper wire in the position shown.

$F = \frac{\kappa I^2 l}{2\pi a} + 5$

$\Sigma F_x = 0 \Rightarrow 2 \cos 80^\circ - \frac{\kappa I^2 l}{2\pi a} - 2gl = 0$

$I = \frac{\omega a}{\rho \cos 80^\circ} + 10$

$I = 2.66 \times 10^3 A + 5$