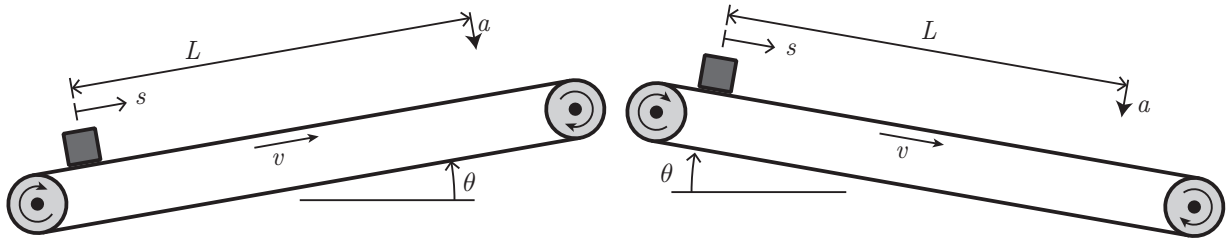


The figure below shows two conveyor belts which are identical in every way except one is oriented upward by an angle θ and the other is oriented downward by the same angle θ . At time $t = 0$, identical slippery blocks of ice are placed onto the two belts. Initially, the ice blocks have zero speed. Both blocks eventually pass locations labeled “a”, a distance L from the starting location. Both blocks eventually reach the belt speed v before traveling a distance L .



1. Draw free body diagrams of the blocks shortly after they are released.
2. On the axes provided (following page), sketch plots of position $s(t)$, and its first two time derivatives $\dot{s}(t)$, and $\ddot{s}(t)$ for each of the two blocks. Both sets of plots should be drawn on the same set of axes to enable comparison.
3. Draw free body diagrams of the blocks at the moments they pass locations labeled “a.”

