[mex148] Chain sliding off the edge of table without friction

A uniform chain of total length A has a portion B $(0 < B < A)$ hanging over the edge of a table with a smooth (frictionless) surface. Show that the time it takes the chain to slide off the table if it starts from rest is

$$T = \sqrt{\frac{A}{g}} \ln\left(\frac{A}{B} + \sqrt{\frac{A^2}{B^2} - 1}\right).$$

Solution: