Block Sliding Down a Frictionless Wedge

(Taylor Example 7.5) Consider a block with mass m sliding frictionlessly down an wedge with mass M that makes an angle α. The wedge itself slides frictionlessly across a horizontal floor near the surface of Earth. The block is released from the top of the wedge, with both objects initially at rest.

If length of the sloping face is d, how long does the block take to reach the bottom?

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