Name_____

Physics 111 Quiz #5, October 22, 2021

*Please show all work, thoughts and/or reasoning in order to receive partial credit. The quiz is worth 10 points total.*

*I affirm that I have carried out my academic endeavors with full academic honesty.*

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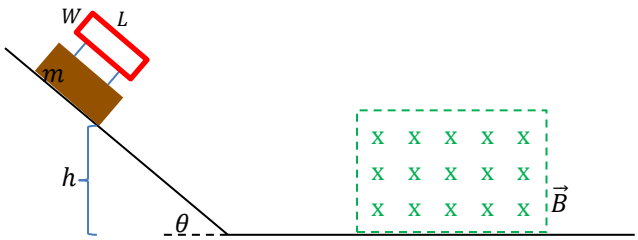
1. Suppose that a rectangular loop of wire of length $L = 10cm$, width $W = 4cm$, and resistance $R = 0.3\Omega$, is mounted to a block of wood of mass $m = 500g$. The system is released from rest at a height $h = 50cm$ above the ground. On the horizontal portion of the track there is a uniform region of magnetic field with magnitude $B$. Assuming all surfaces are frictionless, what is the speed of the cart at the bottom of the ramp?




2. What is the direction of the current induced in the wire loop as soon as the loop enters the magnetic field? Be sure to explain your answer fully.

3. When the loop is one-half of the way into the magnetic field, what is the magnitude of the induced current in the wire loop?

4. What is the magnetic force on the loop when it is one-half of the way into the magnetic field?

5. What is the magnitude and direction of the induced electric filed in the right-hand side of the wire loop when the loop is one-half of the way into the field?