

<b>Name:</b>	<b>Signature:</b>
<b>Department:</b>	<b>Number:</b>

Q3. (25 pts)

An object of mass 0.05 kg is released at time  $t=0$  above a flat surface at an initial height of 20 m and with an initial horizontal velocity of magnitude  $v_x = 5.0 \text{ m/s}$ . Its weight is the only force acting on the object after its release. Assume that the gravitational acceleration is constant and equals  $10 \text{ m/s}^2$ .

a) Find the time it takes for the object to contact the flat surface.

b) Find the angular momentum of the object with respect to the point of contact in part (a) at any given time  $t$  during its flight.

c) Find the rate of change of its angular momentum at any given time  $t$  during its flight.