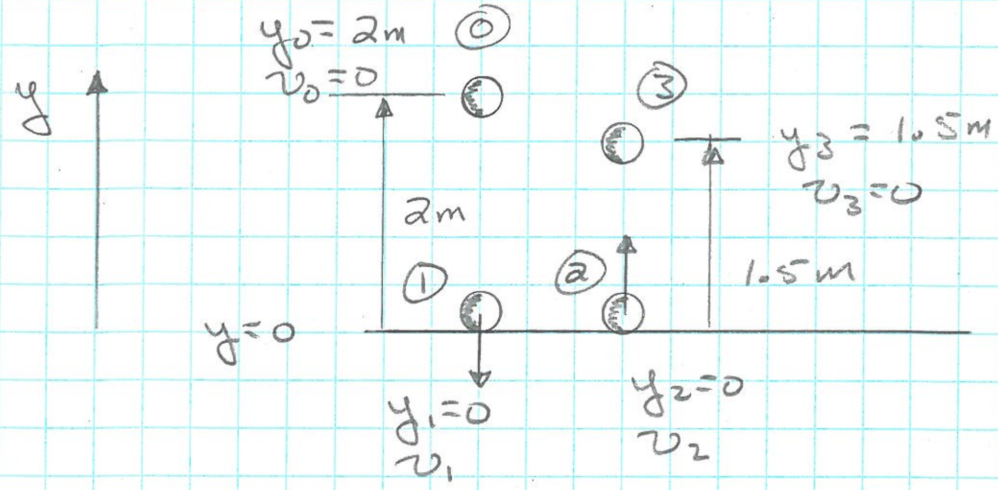

$m = 200g$
$= 0.2 kg$

You can find v_1 & v_2 either using kinematics or energy conservation.

<u>Conserve energy</u> <u>0 → 1</u>

$$\Delta E_{mech} = \Delta K + \Delta U_g = \cancel{W_{nc}}$$

$$\frac{1}{2}\cancel{m}(v_1^2 - \cancel{v_0^2}) + \cancel{m}g(\cancel{y_1} - y_0) = 0$$

$$\frac{1}{2}v_1^2 - gy_0 = 0$$

$$v_1 = \sqrt{2gy_0} = 6.261 \frac{m}{s}$$

Now, we have to be careful here, this is the <u>speed</u> at point ①, we'll need the <u>velocity</u>:

$$v_{1y} = -6.261 \text{ m/s}$$

<u>Same</u> <u>2 → 3</u>:

$$\Delta E_{mech} = \Delta K + \Delta U_g = \cancel{W_{nc}}$$

$$\frac{1}{2}\cancel{m}(\cancel{v_3^2} - v_2^2) + \cancel{m}g(y_3 - \cancel{y_2}) = 0$$

$$-\frac{1}{2}v_2^2 + gy_3 = 0$$

$$v_2 = \sqrt{2gy_3} = 5.422 \text{ m/s}$$

and, $v_{2y} = +5.422$ m/s

Now, the impulse on the ball:

$$\Delta P_y = P_{y_2} - P_{y_1} = J_y = \int F_y \, dt$$

So: $$m v_{y_2} - m v_{y_1} = \int F_y \, dt = \frac{1}{2} F_{max} \Delta t$$

where $\Delta t = 5\,ms = 0.005\,s$

and,

$$F_{max} = \frac{2m(v_{y_2} - v_{y_1})}{\Delta t}$$

$$F_{max} = 934.6\ N$$