Diving Board

WB11-3

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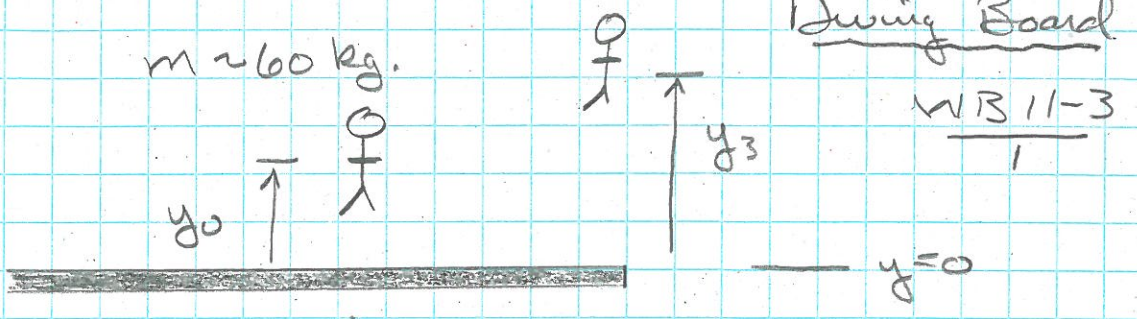

from the video clip, I estimate:

$y_0 \sim 1\,m \qquad y_3 \sim 3\,m$

and time in contact with board, $\Delta t \sim 1\,s$

So, as in prob. WB11-2:

$$v_{y_1} = -\sqrt{2 g y_0} = -4.4\ m/s \quad \text{(component)}$$

$$v_{y_2} = \sqrt{2 g y_3} = 7.7\ m/s \quad \text{(component)}$$

$$\Delta p_y = p_{y_2} - p_{y_1} = J_y = \int F_y\, dt \sim \frac{1}{2}\Delta t\, F_{max}$$

$$m v_{y_2} - m v_{y_1} = \frac{1}{2}\Delta t F_{max}$$

$$F_{max} = \frac{2(m v_{y_2} - m v_{y_1})}{\Delta t} \approx \underline{1450\ N}$$

Note that the diver's weight is, $w = mg$

$= 588 N$

So, $\frac{F_{max}}{w} \approx 2.5$