

Answer on Question #52858 - Physics - Mechanics | Kinematics | Dynamics

Question

A dog runs at 2.3 m/s horizontally and is unable to stop before it falls off of the stairs 3 seconds later. How high from the ground is the stairs?

Answer

$$v_{0x} = 2.3 \frac{m}{s}; v_{0y} = 0; t_f = 3 \text{ s}; a_y = g = 9.8 \frac{m}{s^2}; a_x = 0; x_0 = 0.$$

The equation of motion in horizontal direction:

$$x = v_{0x} t_f$$

The equation of motion in vertical direction:

$$y = 0 = h - \frac{gt_f^2}{2} \rightarrow h = \frac{gt_f^2}{2} = 44.1 \text{ m}$$

P.S. Probably this question contains mistakes (in condition), or there is not all question.