

Answer on Question #46720, Physics, Other

Question:

A cat jumps on to a railing at a height of 1.20 m above the ground. He jumps at an angle of 70 degrees relative to the floor. How fast does he have to be moving when he leaves the floor in order for him to make it up to the railing?

Answer:

Maximum height equals:

$$h = \frac{v_y^2}{2g}$$

where v_y is vertical component of initial velocity.

$$v_y = \sqrt{2gh}$$

Therefore, initial velocity equals:

$$v = \frac{v_y}{\sin 70^\circ} = \frac{\sqrt{2gh}}{\sin 70^\circ} = 5.16 \frac{m}{s}$$

Answer: $5.16 \frac{m}{s}$