1. A toy car runs of the edge of a table that is 1.267 m high. The car lands 0.5736 m from the base of the table. How long does it take for the car to fall? The acceleration due to gravity is 9.8 m/s. What is the horizontal velocity of the car?

$h = 1.267\ m$ $d = 0.5736\ m$ $g = 9.8\frac{m}{s^2}$	*Solution.* Let X and Y axes be directed in horizontal (towards motion of the toy) and in vertical (down) directions. Let the beginning point of the coordinate system be at the initial point of the toy. The equations of the coordinates of the toy are $x = v_0 t, \quad y = \frac{gt^2}{2}.$
$t, v_0 - ?$	

According to the condition of the problem, at the moment of the landing,

$$d = v_0 t, \quad h = \frac{gt^2}{2}.$$

So, the time of the flight is

$$\boxed{t = \sqrt{\frac{2h}{g}}}.$$

The initial velocity is

$$\boxed{v_0 = \frac{d}{t}}.$$

Let check the dimensions.

$$[t] = \sqrt{\frac{m}{\frac{m}{s^2}}} = s, \quad [v_0] = \frac{m}{s}.$$

Let evaluate the quantities.

$$t = \sqrt{\frac{2 \cdot 1.267}{9.8}} = 0.5085(s), \quad v_0 = \frac{0.5736}{0.5085} = 1.128\left(\frac{m}{s}\right).$$

Answer: $0.5085\,s, \quad 1.128\frac{m}{s}$.