3-1)

Find the speed with which Lars will just touch the edge of the ledge.

Pick the origin to be the top of the cliff, x positive to the right, and y positive upward.

 $\begin{array}{l} x_i = 0 \\ x_f = 1.75 \ m \\ v_{ix} = ? \ (= v_o) \\ v_{xf} = ? \\ a_x = 0 \ (influence \ of \ gravity \ only) \end{array}$

 $\begin{array}{l} y_i = 0 \\ y_f = -9 \ m \\ v_{iy} = 0 \ (jumps \ horizontally) \\ v_{yf} = ? \\ a_y = -9.8 \ m/s^2 \ (influence \ of \ gravity \ only) \end{array}$

Use the y information to find the time to fall:

$$\begin{split} y_f &= y_i + v_{iy}t + \frac{1}{2a_y}t^2 \\ -9 &= 0 + 0*t - 4.9t^2 \\ t^2 &= [-9]/[-4.9] = 1.84 \\ t &= 1.36 \text{ seconds} \end{split}$$

Substitute this value into the x equation: $x_f = x_i + v_{ix}t + \frac{1}{2}a_xt^2$ $1.75 = 0 + v_{ix}(1.36) + 0$ $v_{ix} = 1.75/1.36 = 1.29$ m/s