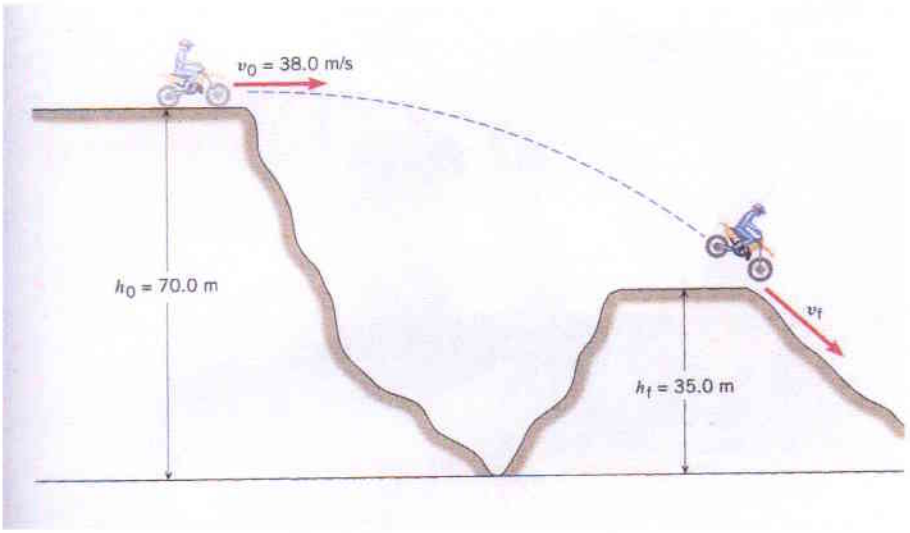

A motorcyclist is trying to leap across the canyon by driving horizontally off the cliff. When it leaves the cliff, the cycle has a speed of 38.0 m/s. Ignoring air resistance what is the speed when the driver strikes the ground on the other side?

Solved w/ Cons. Mechanical Energy:

$$\frac{1}{2}mv_i^2 + mgh_i = \frac{1}{2}mv_f^2 + mgh_f$$

$h_f = 0$

$v_i = 38.0\ m/s$

$h_i = 35.0\ m$

$$v_f^2 = v_i^2 + 2gh_i$$

$$v_f^2 = 38.0^2 + 2(9.81)(35.0)$$

$$v_f = 46.2\ m/s$$

Same equation. I feel like in the cons. of ME solution, I'm putting both x and y components into the kinematics equation, after I've learned to treat x and y separately.

Solved w/ kinematics:

$v_{ix} = 38.0\ m/s$

$\Delta d = -35.0\ m$

$v_{iy} = 0\ m/s$

$$v_{fy}^2 = v_{iy}^2 + 2g\Delta d$$

$$v_{fy}^2 = 0^2 + 2(-9.81)(-35.0)$$

$$v_{fy} = 26.2\ m/s$$

$$v_f = \sqrt{38.0^2 + 26.2^2}$$

$$v_f = 46.2\ m/s$$

Does only a component of gravity do work? The component along the direction of the motion? If yes, does that have to do w/ why cons. of ME works out?