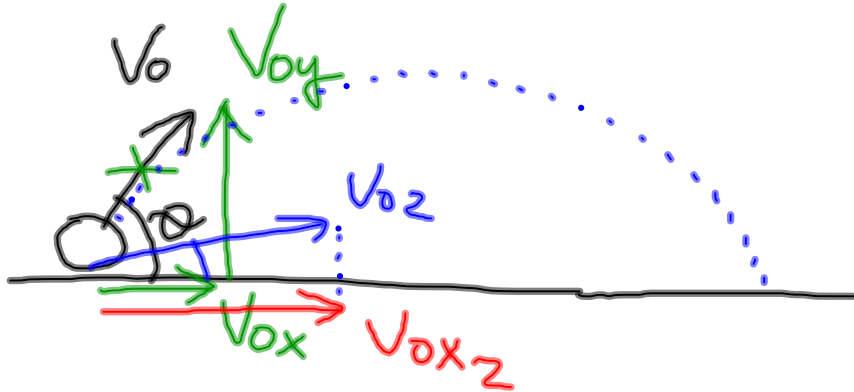


The original projectile was fired with the initial velocity of  $v_{01}$  at an angle  $\theta_1$  (less than  $45^\circ$  above the horizontal).

a) What do you need to change in the original physical setup to **increase ONLY** the initial horizontal velocity? Be specific.

b) Is it physically possible to double the initial horizontal velocity? Provide a mathematical proof.



Nov 4-7:39 AM

Since  $v_{0x} = v_0 \cos(\theta)$ , the only way to increase its value is to increase the value of  $\cos(\theta)$ . To increase the value of  $\cos(\theta)$ ,  $\theta$  has to decrease to be less than  $45^\circ$ .

Increasing the magnitude of  $v_0$  doesn't work because it would also increase the initial vertical velocity.

Nov 5-12:38 PM