

Projectile Motion Literal Equation Practice

A.) 1. Write the literal equation for time in the air of a projectile that lands at the same height from which it took off in terms of v_i , θ & g .

You may also include trig. identities & constant.

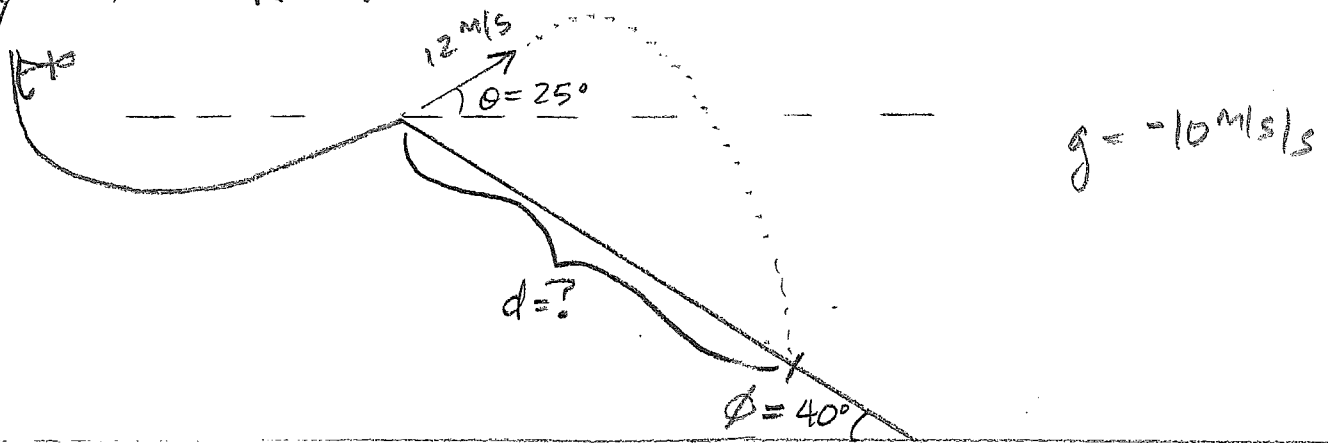
2. Write the literal equation for the Range of a projectile that lands at the same height from which it took off in terms of:

v_i , θ & g . You may also include trig. identities and constants as needed.

B.) 1. Write the literal equation for half the time in the air of a projectile that lands at the same height from which it took off in terms of v_i , θ , g along with trig identities and constants.

2. Write the literal equation for maximum height of a projectile in terms of v_i , θ , g along with any necessary trig. identities or constants.

c.) A skier leaves a ski jump ramp with a velocity of 12 m/s at an angle of $\theta = 25^\circ$ from the horizontal. The skier lands down a ski slope at some distance. The slope has a constant slope of $\phi = 40^\circ$. What is the distance down the slope landed by the skier?



D.)



Two cannons will be shot on a level field each with an initial velocity of 45 m/s as shown above.

1. If cannon 1 fires first, how much time should pass before firing cannon 2?
2. If cannon 2 fires first, how much time should pass before firing cannon 1?

* The goal is for the two cannon balls to meet in the air.

* Carry the decimals to four places.

F.) 1. Write the literal equation for max height reached by a projectile in terms of t_{total} & g only.

hint: Consider the top down second half of the flight where the time is $\frac{1}{2}t_{\text{total}}$ for the half trip.

2. An object is dropped from height 'h' and strikes the ground with velocity 'v'. If the object is dropped from a new height of $4h$, by what factor will its impact velocity increase?

3. For #2 by what factor would time increase if the height became $4h$?

4. A projectile launched straight up at 20 m/s will reach a maximum height of what? $g = 10 \text{ m/s}^2$

- F.) 1. An object is dropped from height ' h ' and strikes the ground going velocity ' v '. If the object is dropped from a new height of $9h$, by what factor will its impact velocity increase?
2. By what factor will time in the air increase if h becomes $9h$?