Physics - Projectile Motion Cheat Sheet

by BeeBooBopNerd via cheatography.com/131975/cs/26636/

Vocabulary

projectile	object moving through the air, either initially thrown or dropped, subject only to the effects of gravity
tragectory	the path of a projectile, which is parabolic in two dimensions
projectile motion	movement of an object through the air, subject only to the effects of gravity
range	the maximum horizontal distance a projectile travels
launch angle	The angle of a projectile's initial velocity when measured from the horizontal direction. These angles are typically 90° or less

Kinematic Equations

- $V = \frac{\Delta \text{position}}{\Delta \text{time}}$ 1)
- $V_f = V_i + at$
- $V_f^2 = V_i^2 + 2aD$
- $D = V_i t + \frac{1}{2}at^2$
- $D = V_f t - \frac{1}{2}at^2$
- $D = \frac{1}{2}(V_f + V_i)t$

How to Solve (Launched at an Angle)

1.) Draw a diagram of the scenario

- Make sure to label everything or Brian will be mad

2.) List our known and unknown variables

- Make a T-chart with an *x* and *y* column where you fill out the variable

3.) Break the motion into horizontal and vertical components parallel t

- Motion in each dimension is indepe ndent of each other

4.) Solve for the unknowns in two separate motions - one horizontal and

- Use the kinematic equations to solve. Usually, try to find time first

When solving for the initial velocities, you have to use trig, so x would be the initial velocity times

Tips (Horizontal Projectiles)

- Um just make sure to always find
- Also, you usually know the initi
- The final velocity for y, when i

How to solve (Horizontal Projectiles)

1.) List our known and unknown variables

- make a t-chart with an x and y column where you fill out the variable

2.) Break the motion into horizontal and vertical components parallel t

- Motion in each dimension is indepe ndent of each other

3.) Solve for the unknowns in two separate motions - one horizontal and

- Use the kinematic equations to solve. Usually try to find time first

Common Mistakes and Misconceptions

1.) **Remember: What happens in the vertical direction does NOT affect the horizontal direction, and vise vers**

- An object's horizontal position, velocity, or accele ration does not affect it's vertical position, veloci

2.) **It's easy to forget that horizontal motion has constant velocity (and zero accele ration) while vertical**

- This means for projectile motion, the initial velocity in the x-dire ction will be the same as the final v y.

3.) **Make sure to define the coordinate axes and pay attention to the sign of the accele ration constant *g*.**

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