

4 Projectile Motion

Worksheet C: *Projectiles Strike Again*

Name _____

AP Physics B

Assume air resistance is negligible and that $g = -9.80 \text{ m/s}^2$ (or -32.2 ft/s^2). Show your work on this paper.

1. A body projected upward from level ground at an angle of 20.0° with the horizontal has an initial speed of 30.0 m/s . How far from the starting point will it strike?

2. An object is projected downward at an angle of 20.0° with the horizontal with an initial speed of 40.0 m/s from the top of a cliff 150 m high.
- In what time will it strike the ground?
 - How far from the foot of the cliff will it strike the ground?
 - At what angle with the horizontal will it strike?

USE TRIGONOMETRY, BUT BE CAREFUL IN DECIDING WHETHER TO USE DISPLACEMENT OR VELOCITY VECTORS

3. A rifle is aimed horizontally at a target 30.0 m away. The bullet hits the target 7.50 cm below the aiming point. What is the muzzle velocity of the rifle?

4. A cannon on a level plain shoots a shell with a muzzle velocity of 60.0 m/s at 50.0° above the horizontal toward a vertical cliff 365 m away. How far above the bottom does the shell strike the side wall of the cliff?
5. A cannonball is shot with a speed of 65.0 m/s at an angle of 37.0° above the horizontal. It strikes a castle wall 250 horizontal meters away. How high above the cannon did the ball strike?
6. A World Series batter hits a home run ball with a velocity of 37.0 m/s at an angle of 26.0° above the horizontal. A fielder who has a reach of 2.00 m above the ground is backed up against the bleacher wall which is 118 m from home plate. The ball was 1.00 m above the ground when it was hit. How high above the fielder's glove does the ball pass?