

Honors-----

Projectile Problems 2: Remember the steps and formulas.... Solve on a fresh piece of paper to leave yourself room to work!!!

1) If a bullet from a gun is shot horizontally at 500 mph (223.5 m/s), how far does it drop after 100 meters? How about shooting at an angle of 45 degrees?

*Answer:  $Dy = - .98 \text{ m}, 98.03 \text{ m (up)}$*

2) In the movie "The Gods must be Crazy", it begins with a pilot dropping a bottle out of an airplane. It is recovered by a surprised native below, who thinks it is a message from the gods. IF the plane from which the bottle was dropped was flying at an altitude of 500 m, and the bottle lands 400m horizontally from the initial dropping point, how fast was the plane flying when the bottle was released?

*Answer:  $Vx = 39.6 \text{ m/s}$*

3) If I toss a marble into the air at a velocity of 3.9 m/s at an angle of 50 degrees, and it reaches the same height some seconds later, how far did it travel horizontally?

*Answer:  $Dx = 1.528 \text{ m}$*

4) Jack be nimble, Jack be quick, Jack jumped over the candlestick with a velocity of 5 m/s at an angle of 30 degrees. Did Jack burn his feet on the 0.25 m high candle?

*Answer:  $Dy = .319 \text{ m}, \text{ no!}$*

5) RANGE: How far away from a target, 2 m above you, do you have to stand to hit it, throwing a ball at 25 m/s at a 30 degree angle?

*Answer:  $Dx = 3.7 \text{ m or } 51.5 \text{ m}$*

6) Minnie jumps up off a 14 meter high cliff at a 20 degree angle with a speed of 5 m/s. Mickey is at the bottom of the cliff, 55 meters away from the bottom. He starts running when she reaches the apex of her jump. How fast should he run to catch her?

*Answer:  $V_{\text{mickey}} = 29.411 \text{ m/s}$*

THINKING QUESTION:

A monkey is in a 10 m high tree and falls. A hunter is on the ground 20 m away aiming directly at the monkey. How fast does he have to fire the gun to hit the monkey as it falls? Draw a picture and explain. USE ALGEBRA TO PROVE YOUR ANSWER!

If you are standing 5 m away from a target that is 2 meters above you, what angle do you need to hold a gun that shoots 25 m/s to hit it on the way down?