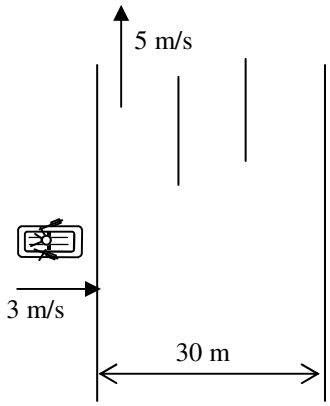
Due Tues., Oct 16

2012 PreAP Two Dimensions 17



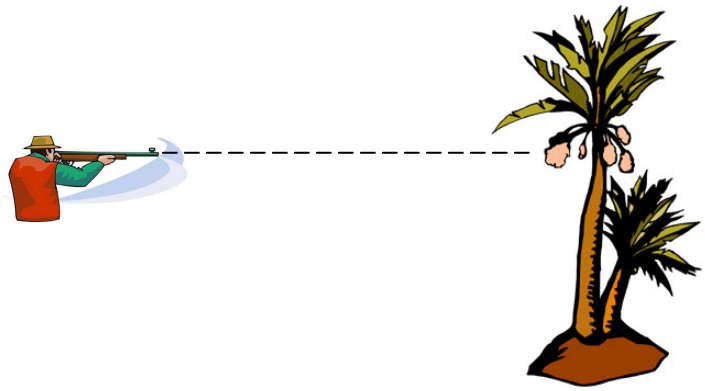
1. A. * Calculate Jim's velocity and direction when he is in the stream.

   B. * Calculate how far downstream he lands (from straight across).

   C. If the stream's speed is doubled, how does the time to cross the stream change?

   C. Calculate what angle he would have to point to go straight across. (BIG *HINT: read the bottom of your "Relative Motion" notes).*

2. A bullet is fired <u>horizontally</u> from a gun aimed directly at a coconut dropped from a tree 5 meters away. The coconut is at the exact same height as the gun and drops at the exact same time the bullet is fired. Will the bullet hit the coconut? Why or why not?



3. * Bank robbers are driving their car 25 m/s along a level road at the top of a 65 m cliff trying to elude the police. Trying to pass the loot to their associates down at the bottom of the cliff, they drop the money. How far away from the point they drop the money does the money back hit the ground below?

4. A battle ship fires its guns at an enemy ship that is 1200 m away. If the gunners mate shoots 120 m/s at an angle of 35°. Since both ships are obviously in the water, you can assume it is water to water (kinda like "ground to ground").
   A. * Do they hit the enemy ship? (*Have to give proof of range.)*

   B. Should they move the gun to a bigger or shallower angle to hit the target?
   C. * What is the velocity of the round (projectile) as it passes its top point?
   D. What is its final y-velocity? E. What is its final x-velocity?

5. * A projectile is launched 18 m/s at an angle of 42°. What minimum ceiling height would be needed?

1A) 5.83 m/s at 59° 1B) 50 m 1C) really, study the bottom of the notes. It tells you.
3) horizontal launch x = 91 m
4A) 14 sec so, 1376 m 4C) 98.3 m/s (Vy = 0)
5) 7.3 m