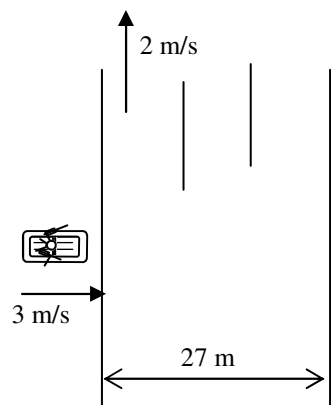
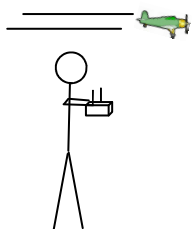


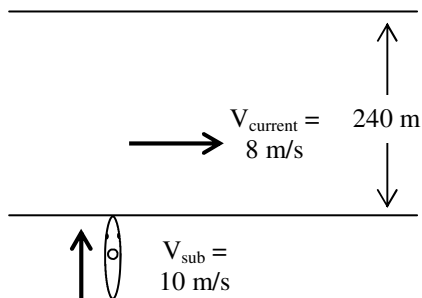
2012 PreAP Two Dimensions 12



1. While rowing his boat, Slim Jim comes across an ocean current that is 27 m wide.
 - A. How fast would Jim be moving if he rowed with the current?
 - B. How long does it take for him to get across the current?
 - C. * How far does the current carry him (how far up)?
 - D. *What is his resulting velocity in the current (and direction, of course)?
 - E. *If he wanted to go straight across, what angle would he need to aim his row boat? (Give your angle from east.)



2. * Slim Jim is playing with his model airplane. The plane flies 8 m/s at direction of 75 degrees for 35 seconds. Then he turns the plane so that it is flying at a direction of 135 degrees for 18 seconds (at the same speed) until it runs out of fuel.
 - A. How far (and in what direction) does the plane move in the first part of its flight?
 - B. How far (direction, too) does the plane move in the second part of its flight?
 - C. Now that you have displacement vectors instead of velocity vectors, how far (and at what direction) does Slim Jim have to walk to pick up his plane?



3. * A submarine on patrol comes across an underwater canyon that has a consistent current flowing thru it directly west. (I am going to skip some of the steps above, but you can refer to them in Q1 if you need to.)
 - A. * By the time the sub has crossed the current, how far down stream (to the right) has the sub drifted?
 - B. What is the sub's resultant velocity as it crosses (mag and direction)?
 - C. * Calculate its angle to get straight across.

4. Which kind of projectile motion problem: I—horizontally launched; II—how high; III ground-to-ground?
- A. ____ A rock is launched from a sling shot going 15 m/s at 65° . The ceiling is 10 m tall. Does it hit the ceiling?
 - B. ____ A bicyclist riding 8 m/s drops a rock from their hand, which is 0.8 m above the road. How far away does the rock land?
 - C. ____ A rabbit hops 4.2 m/s at an angle of 30° with each hop. How far apart are the rabbit's hops?

- 1C) 18 m 1D) 3.6 m/s at 33.7° 1E) -41.8°
2) $x_{\text{total}} = -29.4$ m $y_{\text{total}} = 372.3$ m 3) 33.9 m
4) 4.9 m