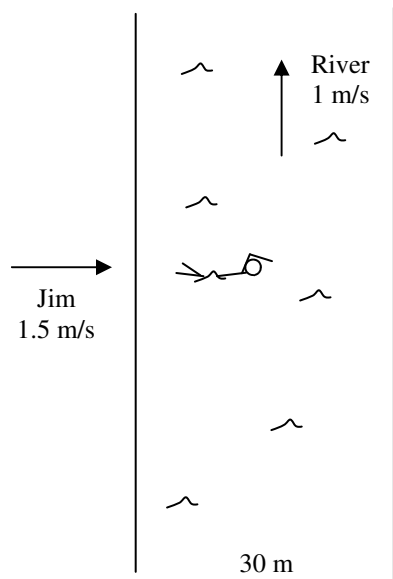


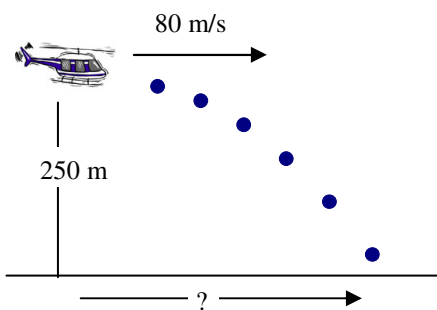
2011 PreAP Two Dimensions 10



1. Slim Jim decides to swim in the river. Jim can swim 1.5 m/s and the river flows 1 m/s.
 - A. * If Jim swam WITH the river, what would be his velocity relative to the shore?
 - B. If Jim swam AGAINST the river, what would be his velocity relative to the shore?
Jim then aims perpendicular to the river.
 - C. * How long does it take Jim to swim across the 30 m wide river?
 - D. * How far downstream (up in this diagram) does he drift by the time he gets to the other side?
 - E. * What is his displacement (straight line distance from his starting point) and direction of his landing point?
 - F. What is his total velocity when being pushed by the river?

- G. * If Jim wants to land STRAIGHT ACROSS THE RIVER, at what angle does he need to swim? (*This is just like on the worksheet from class AND on the "Relative Motion" notes.*)

2. * Crazy has a bicycle. He rides 5 m/s for 45 seconds at 25° . Then he turns and rides 4 m/s (a little tired, now) for 12 seconds at 120° at which point he stops. How far and in what direction must Lazy walk to reach his collapsed friend?



3. A helicopter is flying level, going 80 m/s at an altitude of 250 m. The plane then drops a brick. (*Help on the back of "Two Dimensional Motion 8"*)
 - A. * How much time does it take for the brick to hit the ground (assuming no air friction)?

 - B. How far from where he let go of the brick, does the brick land on the ground?

- 1) A) 2.5 m/s C) 20 sec D) 20 m E) 36.1 m and 33.7° G) -41.8°
2) $x_{\text{total}} = 179.9$ m $y_{\text{total}} = 136.7$ m Now figure out mag and direction.
3A) $t = 7.1$ sec