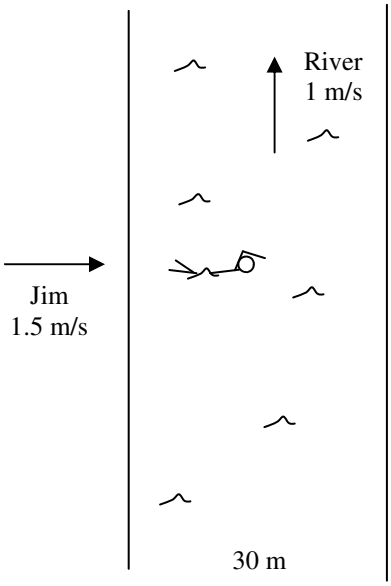
**Due Fri., Oct 5**

# 2012 PreAP Two Dimensions 11




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?

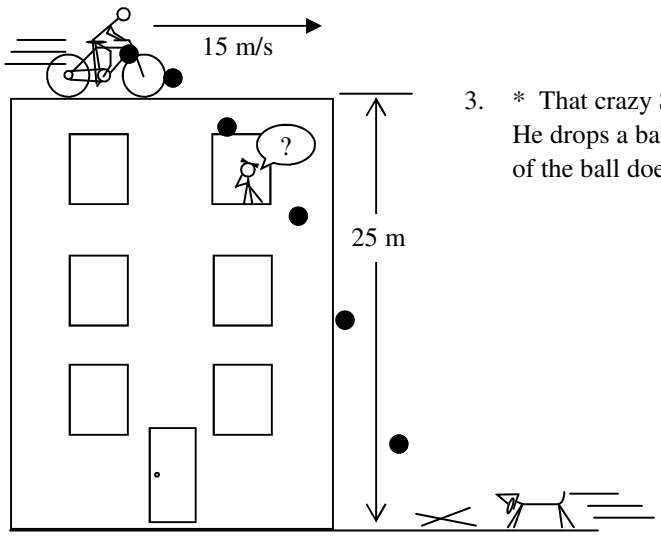
   D. * How far downstream (up in this diagram) does he drift by the time he gets to the other side?

   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? (*Draw it and do the chart*.)




3. * That crazy Slim Jim is riding along the top of a 25 m tall building going 15 m/s. He drops a ball to his dog Bim, below. How far away from where Slim Jim lets go of the ball does Bim catch the ball?

1) A) 2.5 m/s C) 20 sec D) 20 m E) 36.1 m and 33.7° G) −41.8°
2) $x_{total} = 179.9$ m $y_{total} = 136.7$ m Now figure out mag and direction.
3A) Just a horizontally launched projectile. Figure it out.