PreAP Two Dimensions 11
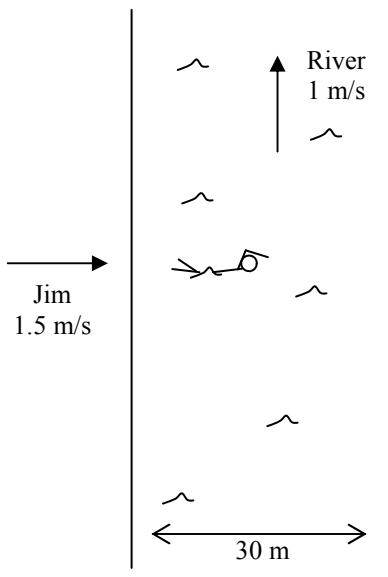
1. Slim Jim decides to swim in the river. Jim can swim 1.5 m/s and the river flows 1 m/s.

   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.*)

River 1 m/s

Jim 1.5 m/s

30 m

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.*)

15 m/s

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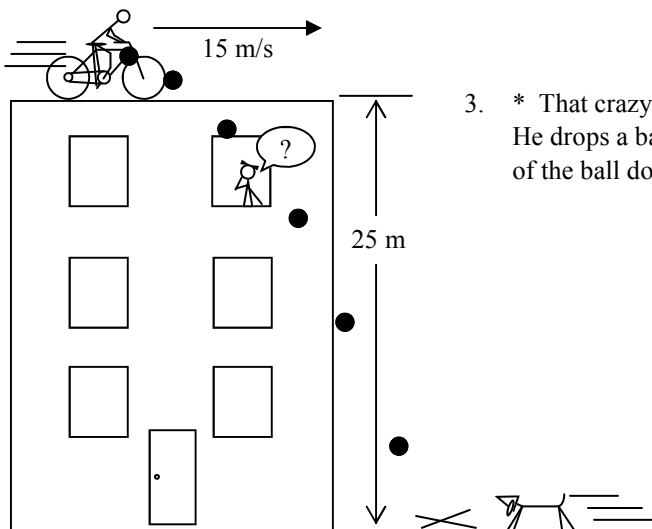
3. * That crazy Slim Jim is riding along the top of a 25 m tall building going 15 m/s. He drops a ball to his dog Bim, below. How far away from where Slim Jim lets go of the ball does Bim catch the ball?

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.