Section 5: Velocity Vectors in Two Dimensions

1 A swimmer jumps into a river and swims for the opposite shore. Her velocity in still water is 4.0 km/h [N]. The current in the river is 3.0 km/h [E]. Find the swimmer's velocity relative to the shore.

2 The velocity of the current in a river is 10.0 m/s [E] and a boat on the river has a velocity of 7.0 m/s [N]. On the boat there is a cart that has a velocity of 4.0 m/s [W]. A turtle is moving on the cart at 3.0 m/s [E] and an ant is moving at 1.0 m/s [S] on the turtle's back. Find the velocity of the ant with respect to the:

A) boat B) water

- A swimmer can swim at a speed of 1.80 m/s in still water. If the current in a river 200.0 m wide is 1.00 m/s [E] and the swimmer starts on the south bank and swims so that she is always headed directly across the river, determine:
 - A) the swimmer's resultant velocity.

B) how long she will take to reach the far shore.

C) how far downstream she will land.

- 4 A swimmer on the south shore of a river wishes to swim to a dock due north of his starting point. His speed in still water is 4.0 km/h and there is a current in the river flowing at 2.5 km/h to the West.
 - A) In what direction must he swim to get directly across the river?

B) If the river is 2.0 km wide, how long does it take him to make the crossing?

- 5. A man attempts to swim at 5.8 m/s due west across a river which flows south with a 2.3 m/s current.
 - A. i. What will be his resultant velocity?
 - ii. How long does it take him to cross the river, if the river is 1500 m wide?
 - iii. How far down stream does he land?

- B. i. In what direction must he swim at his 5.8 m/s speed to get directly across the river?
 - ii. If he does get directly across the river, what was his resultant velocity in crossing the river?
 - iii. If the river is 1500 m wide, how long will it take him to cross the river?