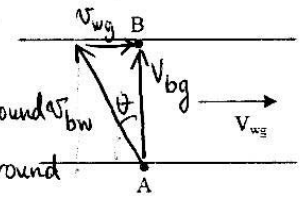
Physics 101Rec
Quiz#3-Sect04
Chapters 4&5

Name: Key Id:

1. The speed of the water flow with respect to ground in a river is 3.0 m/s toward the east. A boat with a speed of 10.0 m/s relative to the water leaves point A and heads in such a way that it crosses to point B.



(a) What is the speed of the boat with respect to the ground?

v_{wg} = velocity of water with respect to ground

v_{bg} = velocity of boat with respect to ground

v_{bw} = velocity of boat with respect to water

From the figure $V_{bw}^2 = V_{wg}^2 + V_{bg}^2$

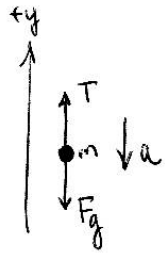
$$V_{bg} = \sqrt{V_{bw}^2 - V_{wg}^2} = \sqrt{(10)^2 - (3)^2} = \boxed{9.5m}$$

(b) In what direction relative to the east must the boat be pointed?

$$\theta = \tan^{-1}\left(\frac{3}{10}\right) = 16.7^\circ$$

the angle is $16.7^\circ + 90^\circ = 106.7^\circ$

2. A 1000 kg elevator accelerates downward at 4.0 m/s^2. What is the tension of the cable on the elevator?



$$T - F_g = -ma$$

$$T = F_g - ma = m(g - a)$$

$$\boxed{T = 5800N}$$