

PHYS 141
In Class Assignment # 4

Name:

Box #:

1. Write down something you learned about centripetal acceleration or relative motion. (2pts)
2. Write down a question you have about centripetal acceleration or relative motion. (2pts)
3. You are riding in a boat going 6.1 m/s at an angle of 25° downstream from the straight across direction relative to the water. The river is flowing at 1.4 m/s. What is your velocity relative to the ground?

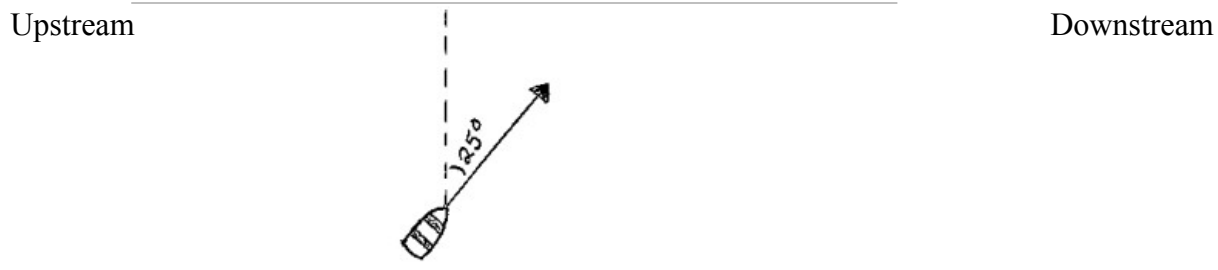
a) Fill in subscripts for the symbols for (3pts)

velocity of the boat with respect to the water $v_{_ _}$

velocity of the water with respect to the ground $v_{_ _}$

velocity of the boat with respect to the ground $v_{_ _}$

b) Use these labels and draw vectors in a picture that includes the boat, river and shore. (4pts)



c) Use the vectors from part a to make an equation relating the relative velocities: (3pts)

$$v_{_ _} = v_{_ _} + v_{_ _}$$

d) Fill in the table to add the two vectors on the right hand side of the equation from part c (6pts)

Vector	x-comp	y-comp
Vector 1		
Vector 2		
resultant		

e) Find the magnitude of the resultant. $R = \sqrt{R_x^2 + R_y^2} = \underline{\hspace{2cm}}$ m/s (3pts)

f) Find the angle of the resultant $\theta = \tan^{-1}\left(\frac{R_y}{R_x}\right) = \underline{\hspace{2cm}}$ degrees (3pts)