The work in GREEN is required.
The work in PURPLE is helpful hints.

Name _____ Date _____

Honors Physics
Period _____

Vectors/Projectiles WS #2H
Mrs. Nadworny

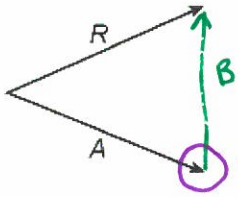
A

Resultants

(21 pts)

Directions –Read online textbook pages 85 – 87. Solve the problem using both methods learned in class.

1. Vectors A and B have a resultant R. Vector A and resultant R are represented in the diagram below.



Draw them head to tail

Which vector best represents vector B?

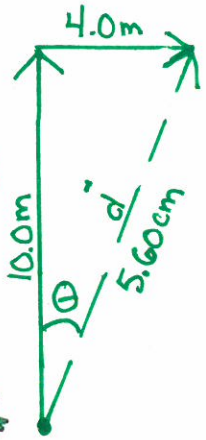
A)  B) C)  D)

(A) B

2. A 5.0 N vector could have perpendicular components of
   ↳ legs of triangle w/ 5.0N as hypot.

   A) 1.0 N & 4.0 N B) 2.0 N & 3.0 N C) 5.0 N & 5.0 N (D) 3.0 N & 4.0 N

3. A frog hops 10.0 meters North along a river bank, and then hops 4.0 meters East to a lily pad. What is the displacement of the frog?

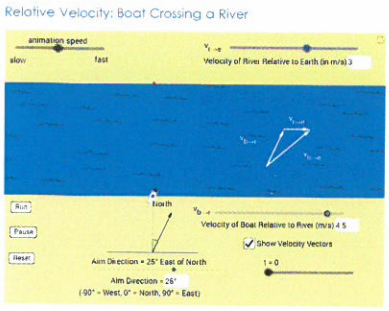
Scale Method	Math Method
Check for: - scale - correct length - correct R - dimensional analysis - angle   1cm = 2m 5.60cm (2m/1cm) 11.2m 22.5° E of N	 OR $d_1 = 10.0m$ $d_2 = 4.0m$ $\vec{d} = ?$ $a^2+b^2=c^2$ $(10.0m)^2 + (4.0m)^2$ 11m $\theta = \tan^{-1}(O/A)$ $= \tan^{-1}(\frac{4.0m}{10.0m})$ $= 22°$ E of N

Check for:
- givens
- two equatio
- two sub w/ units
- two answer correct sf.

Answers in size order: 11, 22

Continued on next page

Go to https://www.geogebra.org/m/jgA3FrVk. It should look like this:



4. The top right corner lists the velocity of the river. Leave this set at 3 m/s. The bottom right hand corner shows the velocity of the boat. Leave this set at 4.5 m/s. In the bottom middle the Aim Direction is set to 25°. Click Run to watch the boat cross the river. The time will display in the bottom right hand corner.

5. Change the Aim Direction (launch angle) to – 90°, 0°, 90°, and any two other angles (one positive and one negative).
   a. Which angle takes the least amount of time for the boat to cross the river?

      0°

   b. Explain why you think that angle takes the least time.

      None of the boat's velocity is "wasted" trying to "overcome" the river

6. Set the launch angle to 0°. Click Run to launch the boat. Record the time it takes to cross the flowing river.

   11.1s

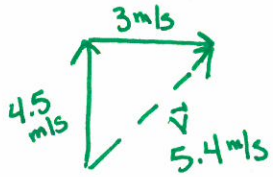
7. In the top right corner, set the velocity of the river to 0 m/s. Click Run to launch the boat. Record the time it takes to cross the stationary river.

   11.1s

8. Compare your results from these two trials. Does the speed of the river affect the time it takes the boat to cross the river?

   The times are the same. The river does NOT affect the time it takes the boat to cross.

9. Set the river velocity back to 3 m/s. Draw and **label** a triangle showing the two components of the velocity (boat velocity and river velocity) as well as the boat's resultant velocity.



(Not drawn to scale)

10. Calculate the magnitude of the boat's resultant velocity when the river is on and **label** this value on the diagram you drew in the previous question. Show your work below.

$a^2+b^2=c^2$

$(4.5\text{m/s})^2+(3.0\text{m/s})^2$

5.4 m/s