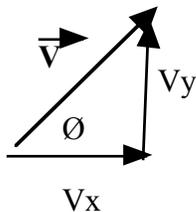


NAME _____

DATE _____



Pythagorean: $V^2 = V_x^2 + V_y^2$
 $V_x = V \cos(\theta)$
 $V_y = V \sin(\theta)$
 $\theta = \tan^{-1}(V_y/V_x)$

VECTOR 3 PROBLEMS

Draw three different ways to add the three vectors to get a resultant:



(From book Chapter 3 pgs 113-117)

23. A submarine dives 110 meters at an angle of 10 degrees below the horizontal. What are the horizontal and vertical components of the sub's displacement? See Sample Problem 3B.
25. A golfer takes two putts to sink his ball in the hole once he is on the green. The first putt displaces the ball 6 m east, and the second putt displaces it 5.4 m south. What displacement would put the ball in the hole on one putt? See Sample Problem 3A
27. A roller coaster travels 41.1 meters at an angle of 40 degrees above the horizontal. How far does it move horizontally and vertically? See Sample Problem 3B
29. A person walks 10 m east, 300 m south, 150 m at 30 degrees south of west, then 200 m at 60 degrees north of west. What is the person's resultant displacement from the starting point? See Sample Problem 3C.
51. A river flows due east at 1.5 m/s. A boat crosses from the south shore to the north shore by maintaining a constant velocity of 10 m/s due north relative to the water.
- What is the velocity of the boat as viewed by an observer on the shore?
 - If the river is 325 m wide, how far downstream has the boat moved by the time it reaches the north shore?
- See Sample Problem 3F
53. A hunter wishes to cross a river that is 1.5 km wide and that flows with a speed of 5 km/hr. The hunter uses a small powerboat that moves at a maximum speed of 12 km/hr with respect to the water. What is the minimum time needed for crossing?
 See Sample Problem 3F

**** Honors:

In problem 53, what is the hunter's displacement? Suppose someone is .2 downstream from the hunter's original position and starts 3 minutes after him. What speed and bearing would they have to have to catch him on the bank?