Name   Date   Period   #
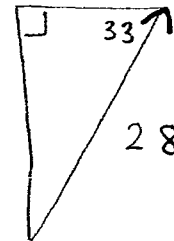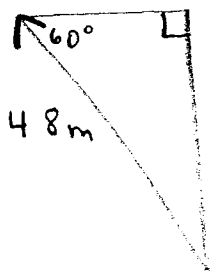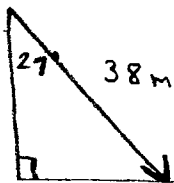
Basic trig and Vector Components

1. Find the x and y components of a vector with magnitude 50.0 at an angle of 33 degrees South of East.

2. Calculate the x and y components for the following triangles.

33

28

27 38 m

60°

48 m

3. Calculate the resultant vector using the following instructions.   What is there final position relative to their initial position?
   a.   Walk 13 ft North.
   b.   Walk 20.5 ft 47 degrees North of West.
   c.   Walk 10. ft East.
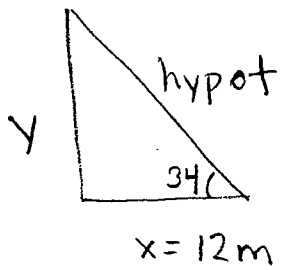
Σ X   Σ Y

4. Calculate the resultant vector using the following instructions.   What is the final position relative to the initial position?
   a.   Walk 13 ft North.
   b.   Walk 20.5 ft 47 degrees North of West.   Don't Do This.
   c.   Walk 10. ft East.

WS 3

y | hypot

34°

$x = 12m$

find y, hypot

$$\sin \theta = \frac{opp}{hyp}$$

$$\cos \theta = \frac{adj}{hyp}$$

$$\tan \theta = \frac{opp}{adj}$$

θ | y | x
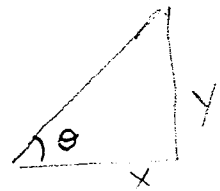
$$a^2 + b^2 = c^2 \quad \text{Pathagorean Thm}$$
for Right Triangles

Find x and y

40. m   38° y

x

x Find x, hypot

15 m   hypot

26°
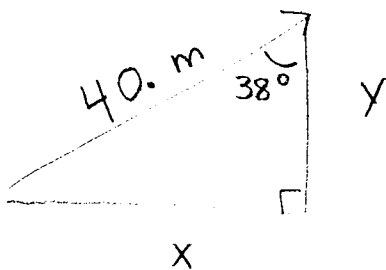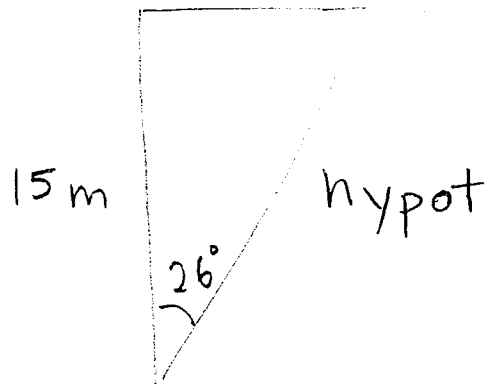
Vector Practice

Calculate the resultant vectors showing the component vectors and final magnitude and direction.
Draw a picture. Show all work!

Ex. Sarah walked 12 miles north, 3.0 miles west, then 15 miles at 27° north of east.

1. A team of ducks flew 100.0 miles north, then 75.0 miles at 45° north of east.

2. A girl delivering newspapers covers her route by traveling three blocks west, four blocks north, then six blocks east.

    a. What is the resultant displacement?

    b. What is the total distance she travels?

3. Jeremy threw the football 37 yards to Henry who ran 13 yards at 15° from the end zone to score a touchdown. How far was Jeremy from the end zone?

4. How would you add two vectors that are not parallel or perpendicular?

5. Can a vector have a component greater than its magnitude?

6. Is it possible to add a vector quantity to a scalar quantity? Explain.

7. A pelican flying along a horizontal path drops a fish from a height of 5.4 m while traveling at 5.0 m/s.

   a. How far does the fish travel horizontally before hitting the water?

   b. What are the fish's horizontal and vertical velocities just before hitting the water?

8. Lost in the wilderness, Erik wandered 15.8 miles at 23° north of east, then 8.7 miles at 30.0° south of west. Relative to his initial position, where does Erik end up?