2009 PreAP Two Dimensions 1
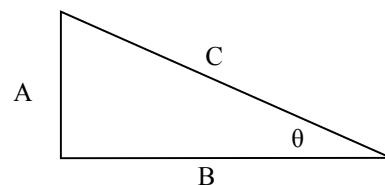
There are 3 pages to this homework, in addition to the "Trigonometry Basics" worksheet.

Let's ensure you know the Pythagorean theorem: $A^2 + B^2 = C^2$,
where A and B are the two sides of a right
triangle and C is the hypotenuse (long side). $8^2 + 17^2 = C^2$ $353 = C^2$
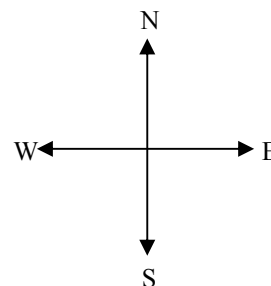*If A = 8m and B = 17 m, then:* $64 + 289 = C^2$ $\sqrt{353}$ $\boxed{18.8m}= C$

As always, show your work.

1. If A = 4m and B = 12 m, find C.

     Don't outthink the following questions. Notice the compass directions
     at the right if you are confused.

2. Positive or Negative?
    A. ___ Walking east?
    B. ___ Walking north?
    C. ___ Walking south?
    D. ___ Walking west?

3. Δx or Δy?
    A. ___ Walking east?
    B. ___ Walking north?
    C. ___ Walking south?
    D. ___ Walking west?

4. A person walks 4 m north, then 8 m south, then, totally confused, walks another 10 m north.
    Find their displacement. (If they started at the origin, where did they end up?) *Write each*
    individual displacement, keeping track of + and -, then solve.

5. Another confused person walks 15 m east, then 20 m west, then 2 m east. What is their displacement?

6. A third, VERY confused person walks 30 m west, then 10 m north, then 5 m south, then 40 m east, then another 6 m north.
    A) Find Δx.

    B) Find Δy.

    C) Using the Pythagorean theorem, find their total displacement (*use Δy and Δx as A and B [doesn't matter which],*
        C is the total displacement).

7. (As you did before.) A FOURTH ***PHENOMENALLY*** confused person walks 50 m north, 12 m east, 60 m west, 10 m south,
    and another 5 m south. Find the person's total displacement.

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Let me explain the grid. The non-arrow black lines are the x and y axis. The arrow represent motion (vectors). Each vector starts at the origin (0,0) and ends at the end of the arrow (the circle). (I assume you know which is the x and y axis and which directions are positive and negative.) To simplify things, let's make each square equal to only 1 meter. When I ask for Δx or Δy I am asking for how far the object moves in the x direction and y direction from its start to its end. Since each arrow starts at the origin, the displacements are the x and y coordinates of the final position (since initial positions are 0,0). ALSO—Some displacements can be negative!!!!!

8. Which arrows have negative y coordinates?

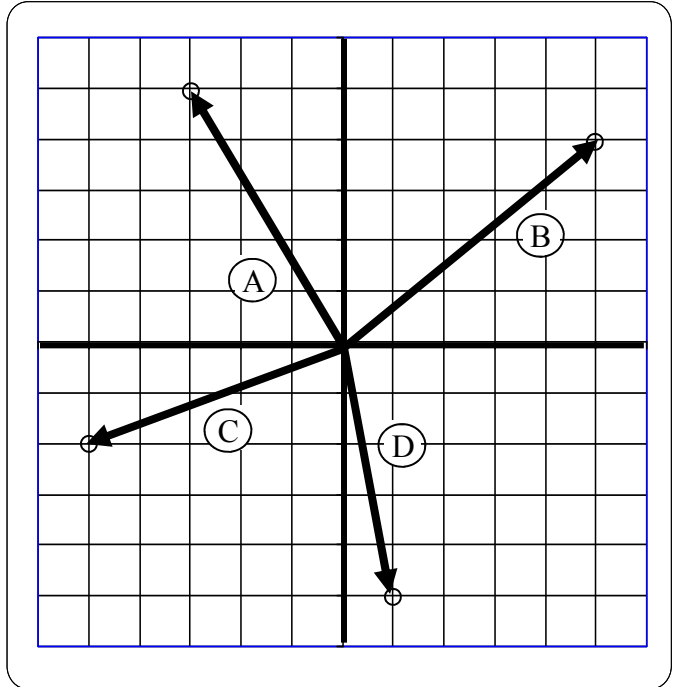9. Which arrows have negative x coordinates?

10. For Arrow B:

    A) Δx = _____; Δy = _____.

    B) Using Δx and Δy as A and B, find the total displacement of Arrow B (find "C").

11. For Arrow A: (*notice negatives*)

    A) Δx = _____; Δy = _____.

    B) Find the total displacement of Arrow A.

12. For Arrow C:

    A) Δx = _____; Δy = _____.

    B) Find the total displacement of Arrow C.

13. Find the total displacement of Arrow D.

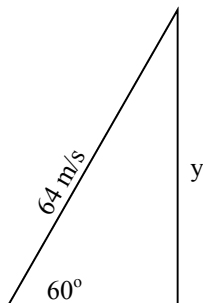*Use your notes: "Trigonometry Basics" to answer the following.*

Triangle 3

21 m

y

θ_1

20 m
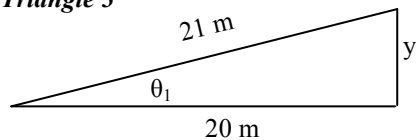
14. On triangle 3, find the y component of 21m (find y).
    <u>Variables</u>:   <u>Equation</u>:   <u>Solve</u>:
    $\theta =$
    opposite =
    adjacent =
    hypotenuse =

64 m/s

y

60°

x

Triangle 4

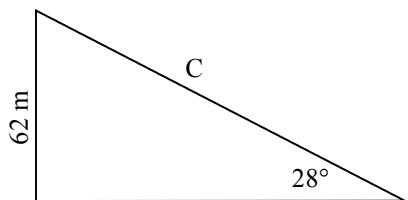15. A. On triangle 4, find the y component of 64 m/s.
        <u>Variables</u>:   <u>Equation</u>:   <u>Solve</u>:

    B. Now, find the x component of 64 m/s.
        <u>Variables</u>:   <u>Equation</u>:   <u>Solve</u>:

62 m

C

28°

x

Triangle 5

16. On triangle 5, calculate BOTH x and the hypotenuse.