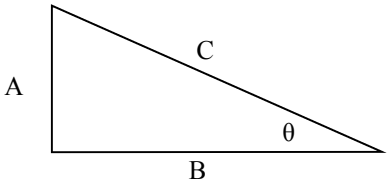
A-Day: Due Thurs., Sept 27 (Assigned: 9/25)
B-Day: Due Fri., Sept 28 (Assigned: 9/26)

Two Dimensions 1

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).
If A = 8m and B = 17 m, then:

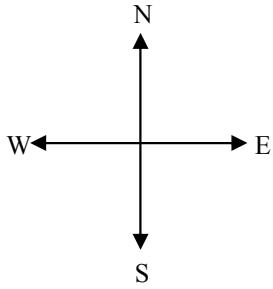


$8^2 + 17^2 = C^2$ $\qquad$ $353 = C^2$

$64 + 289 = C^2$ $\qquad$ $\sqrt{353} = 18.8\text{m} = C$

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*).

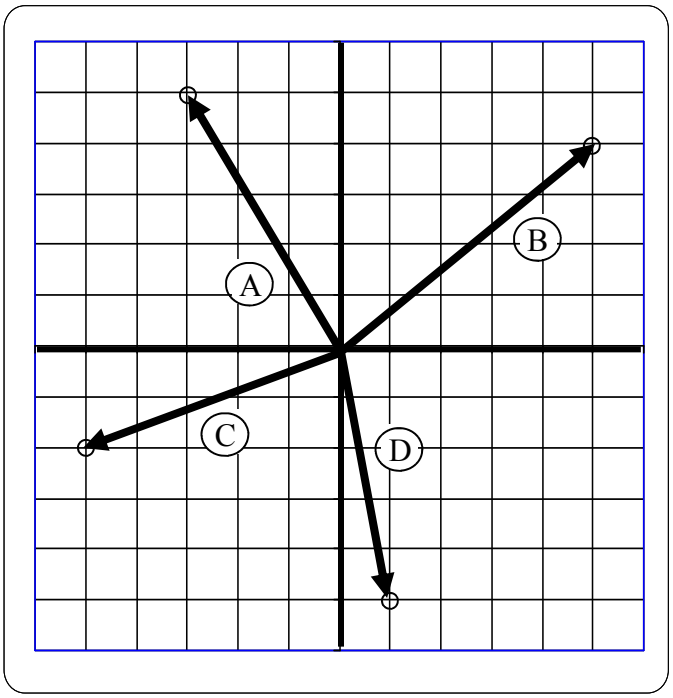
7. (As you did before.) A FOURTH phenomenally confused person walks 50 m north, 12 m east, 60 m west, 10 m south, and another 5 m south. Find the person's total displacement.

More on back

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.