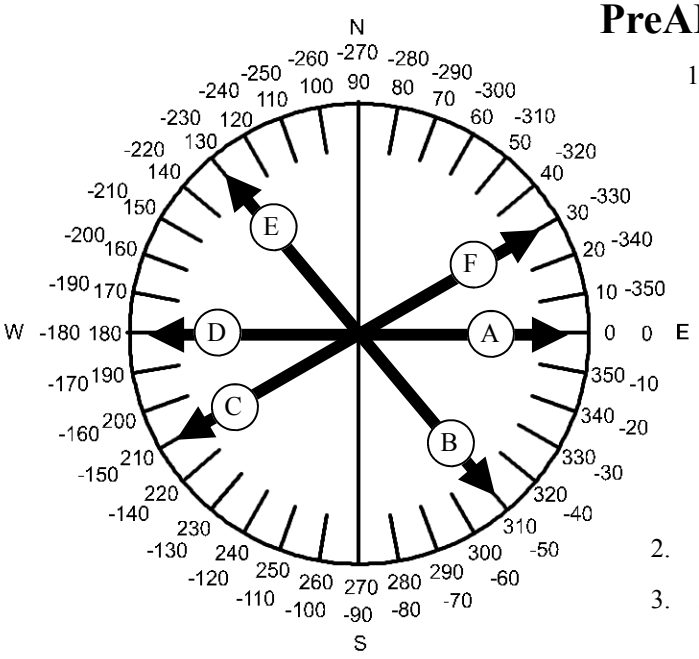
PreAP Two Dimensions 3

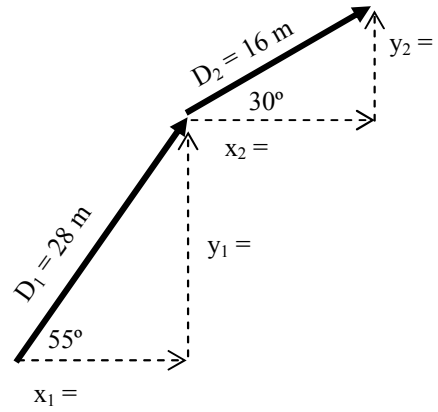


1. Six vectors of equal magnitude (equal length) are shown on the compass at the right. Notice that some of them are opposites of others.
   A. Vector D is obviously = to –Vector A. OR D = –A. The direction of A is 0º. What is the direction of D?
   B. C = –F. The direction of F is _____. The direction of C is_____.
   C. Subtract the direction of F from C and you get how many degrees?
   D. OR 30º + ____ = 210º.
   E. E = – B. OR 130º + _____ = 310º.
   F. But going from B to E you would NOT add 180º. Take 310º and subtract 130º. What do you get?

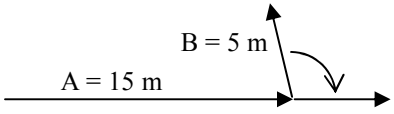
   So, when a vector is subtracted you add or subtract 180º.

2. *B = 2.1 cm at 150°. −3B =
3. If A = 3.5cm at 60°, then −2A =
4. A person walks 15 m west, 10 m north, 25 m east, 6 m south, then another 8 m north.
   A) ΔX_{total} = B) ΔY_{total} = C) Using X_{total} and Y_{total}, draw the triangle.

   D) Calculate the resultant's magnitude and direction.



5. An object moves 28 m at 55° and then 16 m at 30°.
   A) On the diagram, resolve vector 1 and 2 into their components. *(Now you have only x's and y's. YEA! And the rest of this problem is like #4, above.)*
   B) Find X_{total}:
   C) Find Y_{total}:
   D) With X_{total} and Y_{total}, draw your resultant's triangle below and calculate the resultant's magnitude and direction.



6. Vector A = 15 m and Vector B = 5 m. Vector B can swivel, as shown.
   A. What is the largest the resultant could possibly be? (*What is the greatest displacement from your starting position*?)
   B. What is the shortest the resultant could possibly be? (*What is the shortest displacement from your starting position*?)

7. Vector (has magnitude and direction) or Scalar (only magnitude)?

A. ___	* Mass	C. ___	Pressure	E. ___	Distance
B. ___	* Acceleration	D. ___	Displacement	F. ___	Speed

Mass (in kg) is all of an object's atoms and molecules (its matter). Weight (in N) is gravity's pull on your weight.

8. Mass or Weight?

A. ____	18 Newtons	D. ___	Does exist in space.
B. ____	15 kilograms	E. ___	Same on the moon.
C. ____	*Doesn't exist in space.	F. ___	Different on the moon.

Force of Weight (*in Newtons*) → $\mathbf{F_w = mg}$ ← Mass (*in kg*); Acceleration due to gravity (*9.8 m/sec²*)

Weight equals mass times the acceleration due to gravity.

More on back

9. What is the weight of a 12 kg object?

10. What is the mass of a 150 N object?

2) 3B = 6.3 cm at 150°; −3B = 6.3 cm at 330° (opposite direction).
4D) H = 15.6 m; θ = 50.2° 5) R = 43.1 m; θ = 46°
7A) Mass is a scalar because 5 kg to the right makes on sense.
7B) Acceleration is a vector.
8C) Weight (you still have your atoms and molecules in space, I hope)