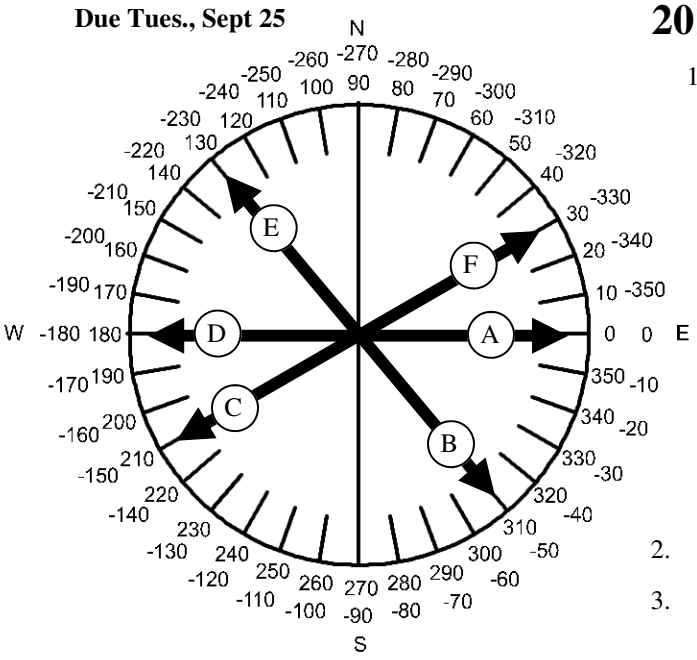
Due Tues., Sept 25

2012 PreAP Two Dimensions 3



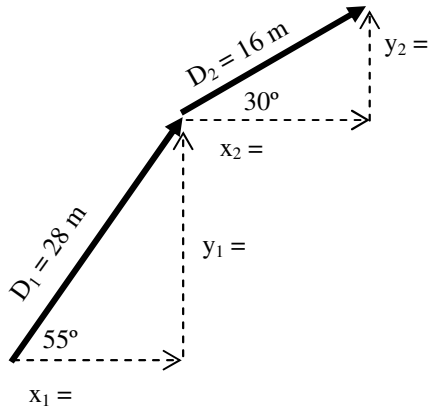
1. Six vectors of equal magnitude (equal length) are shown on the compass at the right. Notice that some of them are opposites of others.
   A. Vector D is obviously = to −Vector A. OR D = −A. The direction of A is 0º. What is the direction of D?
   B. C = −F. The direction of F is _____. The direction 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.

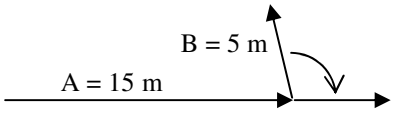
2. *B = 2.1 cm at 150°. −3B =
3. If A = 3.5cm at 60°, then −2A =

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

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.

More on back

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

Force of Weight (*in Newtons*) → $F_w = mg$ ← Mass (*in kg*); Acceleration due to gravity ($9.8\ m/sec^2$)

Weight equals mass times the acceleration due to gravity.

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)