

Unit 4 - **Vectors**! In the previous units, we have discovered many things that are **vector**. i.e. need both a magnitude and a direction. Among these are:

Velocity

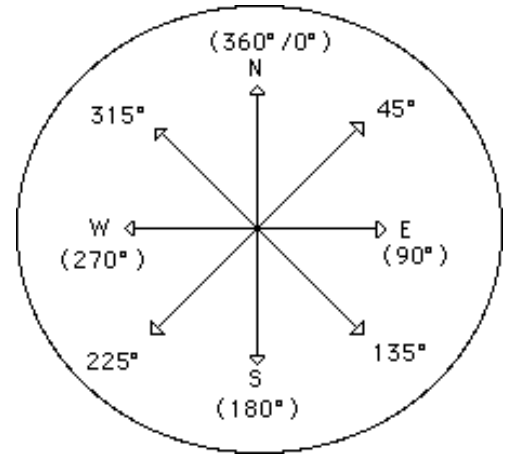
Displacement

Acceleration

Force

We will learn more before the year is over, but we know enough for now to expand a bit... Up till now, we have just used the directions up and down or backwards and forwards, which means we could get away with + and - as our directions... but what if we have different directions? What if we do NOT travel only in straight lines? We need a new orientation system!

The one we will use is called the _____ angle system, which describes a direction based on the points of a compass, with North pointing at 0° . The compass looks like this one, and only works in the horizontal plane:



If you are going west, you are headed at 270° . If you are headed 15° east of south you are going at 165° . What would be the heading for 25° north of west? _____ 25° south of west? _____ 25° west of north? _____

If you walk 47 meters south, then walk 62 m west. What is your displacement? Obviously we are now southwest, but that covers quite a bit of real estate. To be more precise, we will determine a _____. The _____ is the one vector that could replace the others - it is their equal. Displacement is a **vector** term, so it needs both a _____ and a _____. Again: 47 meters south, then walk 62 m west.

We need to calculate the starting angle, then make it a bearing angle. To find the direction, we use _____

Bearing angle would be: _____ This is our direction!

A plane is flying at 24.5 m/s straight north with an east wind of 12.9 m/s affecting it. What is the resultant velocity of the plane?

Even though both are acting at the same time (_____), they are acting separately on the plane. You always line the vectors up _____ - where the first ends, the second begins:

Note the unit stays the same all the way through - add m to m, N to N or m/s to m/s, et cetera...

Final answer = _____ m/s @ _____°

For Homework.... Pb A, of course!

Remember to head-to-tail all drawings

Remember to round magnitudes to correct sig figs, Angles to nearest whole degree

Place in bearing angles