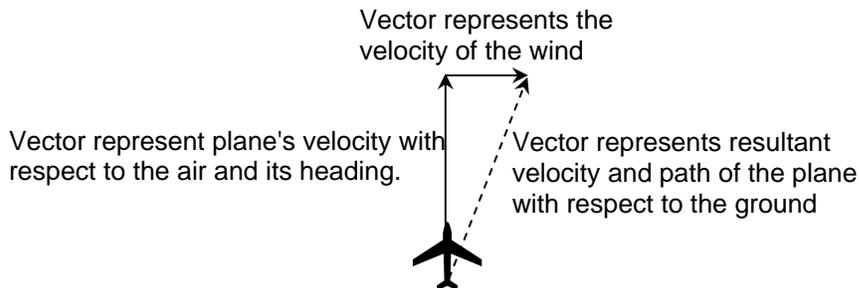


Concept: Airplane navigation questions are simply an extension of relative motion. Planes are subject to the winds, as a result, pilots must alter their heading in order to maintain the desired course.

Terms:

Heading: The direction the nose of the plane is facing. It does not however necessarily refer to the path taken by the plane. For instance, a plane could have a heading due north but be blown off course by a wind. As a result, the plane's displacement and velocity will be at some magnitude and angle away from due north.



Airspeed: The velocity of the plane with respect to the air or the wind.

Ground Speed: The velocity of the plane with respect to the ground.

Wind Direction: Wind directions are usually reported in reference to the direction from which they are coming.

- Easterly: winds from the east
- Northerly: winds from the north
- Southerly: winds from the south
- Westerly: winds from the west

Ex: A plane, heading due north at 700km/h, is flying through an westerly wind blowing at 150km/h (assume all values significant to 3 figures)

- a) Find the plane's ground speed
- b) Find the plane's velocity with respect to the ground
- c) How far off course does the plane fly over 2 hours?
- d) What heading must the plane maintain in order to travel due north with respect to the ground?
- e) What would be the plane's ground speed in d)?

Ex2: A plane, heading due south at 700km/h, is flying through an wind blowing at 150km/h [W30°S] (assume all values significant to 3 figures)

- a) Find the plane's ground speed
- b) Find the plane's velocity with respect to the ground
- c) How far off course does the plane fly over 2 hours?
- d) What heading must the plane maintain in order to travel due south with respect to the ground?
- e) What would be the plane's ground speed in d)?