

Vector Problems #1

1. Which of the following quantities are scalars, and which are vectors?
 - a. The acceleration of a plane as it takes off
 - b. The number of passengers on the plane
 - c. The duration of the flight
 - d. The displacement of the flight
 - e. The amount of fuel required for the flight
2. A novice pilot sets a plane's controls, thinking the plane will fly at 250 km/h to the north. If the wind blows at 75 km/h toward the southeast, what is the plane's resultant velocity? Use graphical techniques.
3. While flying over the Grand Canyon, the pilot slows the plane's engines down to $\frac{1}{2}$ the velocity in problem #2. If the wind's velocity is still 75 km/h toward the southeast, what will the plane's new resultant velocity be? Use graphical techniques.
4. A man lost in a maze makes three consecutive displacements so that at the end of the walk he is back where he started. The first displacement is 8.00 m westward, and the second is 13.0 m north. Use the graphical method to find the third displacement.
5. Add the following vectors and determine the resultant.

3.0 m/s, 45 deg and 5.0 m/s, 135 deg