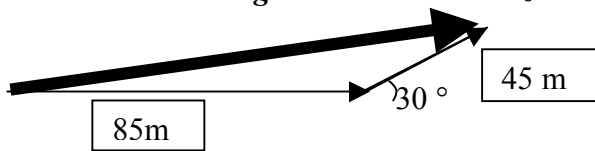


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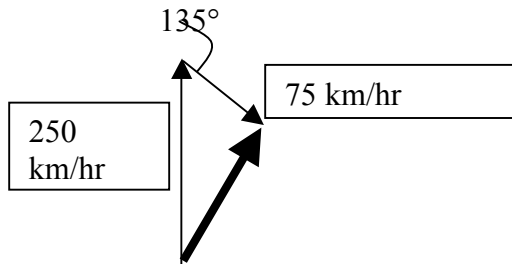
1. Which of the following properties are scalars and which are *vectors*?

- 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

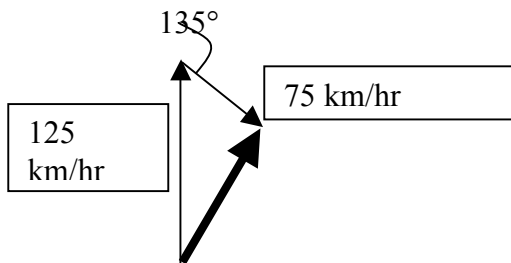
2. A roller coaster moves 85 m horizontally, then travels 45 m at an angle of  $30^\circ$  above the horizontal. What is its displacement from its starting point. Use graphical techniques (with ruler, protractor and graph paper) **DRAWING ACCURATELY: RESULTANT IS 125.9 M AT 10.3 degrees above the horizontal. (79.7 degrees to the vertical)**



3. A novice pilot sets a plane's controls, thinking that the plane will fly 250 km/hr to the north. If the wind blows at 75 km/hr to the south east (  $135^\circ$  ), what is the plane's resultant velocity? Use graphical techniques (with ruler, protractor and graph paper) **Drawing accurately: Resultant is 203.98 kn/hr at 15 degrees East of North (75 degrees North of East).**



4. While flying over the Grand Canyon, the pilot slows the planes engines down to one-half the velocity in item 3 (125 km/hr to the north). If the wind's velocity is still 75 km/hr to the southeast ( $135^\circ$ ), what will the planes new resultant velocity be? Use graphical techniques (with ruler, protractor and graph paper) **Drawing accurately: Resultant is 89.4 km/hr at 36.4 degrees East of North (53.6 degrees North of East).**



5. The water used in many fountains is recycled (ugh!). For instance, a single water particle in a fountain travels through an 85 m system and then returns to the same point. What is the displacement of a water particle during one cycle?

**0**