Vector Problems

Worksheet #2.

Unit 2. Physics 1046

Nova Scotia Community College
May 2013
Vector Problems

NOTE: Each problem should have a well labeled vector diagram and a properly solved vector equation.

1. A pilot has her plane aimed towards the north and it has an airspeed of 400 km/h. The windspeed is 200 km/h, directed towards 130°. What is the groundspeed of the plane?

2. Bob wishes to fly his plane over the ground at 500 km/h, 270°. The wind is blowing 300 km/h, directed towards 150°. What airspeed must the plane maintain in order to stay on course?

3. Jamie walks from home first 40 m, 120° then turns and walks 60 m, 180°. What is her net displacement from home?

4. Lisa drives 60 km, 180° and then 20 km, 30°. How far and in what direction must Lisa travel to return to her starting point by the shortest route possible (assume the presence of roads where required 😊)?

5. Dawn jumps into the river and swims straight to the other side (heading North) at 3.0 km/h. The current of the river flows from the West at 4.0 km/h. Find Dawn’s velocity relative to the shore

Look on the NEXT page for the correct answers. How did you do?
Answers:

1. $V_{PG} = 568 \text{ km/h}, 103^\circ$
2. $V_{PA} = 700 \text{ km/h}, 291^\circ$
3. $X_{\text{net}} = 87 \text{ m}, 156^\circ$
4. $X_{\text{return}} = 44 \text{ km}, 346^\circ$
5. 5.0 km/h, 37°