VECTORS PHYSICS 112/111 Feb 2011

1. AB = 120 m at 120°, AC = 240 m at 310°. Find vector CB.

2. a. AB = 220 m at 020°, AC = 300 m at 150°. Find vector BC.

b. DC = 450 m@020^o, DE = 300 m @140^o, Find vector EC

3. AB = 250 m at 140°, CA = 200 m at 320°. Find vector BC.

4. John wishes to run to Mike's house which is 5.0 km at 090°, but first he wants to get his friend Sally, who lives 1.5 km at 037° from John's house. Find the displacement from Sally's house to Mike's house.

5. A frog hops four times: Twice forward, once to the right, and once forward again. If each hop covers 28.0 cm, find the total displacement.

6. David can row a boat with a speed of 3.5 m/s and wishes to row his boat directly across a river that flows with a velocity of 1.3 m/s at 090°. Find the direction that he should head and find the resultant velocity.

7. A boat is being pulled along a canal that runs due east by two horses that are tied to the boat. If the horses apply forces of 500 N at 060° and 500 N at 120° respectively, find the resultant force on the boat.

8. Hansel and Gretel are on their way to Grandma's house. They walk 3.2 km at 037° until they see the Big Bad Wolf on the path. Scared silly, they leave the path and run 1.4 km at 340° and find a little shack in the forest where they rest for awhile. When they think the coast is clear, they head out again and walk 2.5 km at 075°. Gretel sensing that they are lost asks, "I want to go home". Hansel scratches his forehead and says "I don't know which way to go. Find: a. The displacement that would return them home. b. If the displacement from their home to Grandma's is 5.0 km at 020°, what displacement would bring them to Grandma's?

9. A swimmer wishes to cross a river that flows with a current of 2.0 m/s at 090°. If the swimmer can swim with a speed of 3.0 m/s, find the heading she should take so that she reaches the other shore directly across from her point of origin.

10. A plane is taking off from the Halifax airport for Boston, 500 km at 210°. The air speed of the plane is 800 km/h. If the wind speed is 150 km/h at 340°, find the course the pilot should plot and the time it will take to reach Boston (*to find time you must know resultant velocity)

11. Upon reaching Boston, the pilot now must fly to Toronto. Toronto is 1200 km at 320° from Boston. Assuming the wind speed to be the same, find heading pilot must plot and the time to reach Toronto.

12. Next, the plane is off to Los Angeles, which is 3000 km at 225°. Find the course heading he must plot and the time assuming the wind is the same.

13. Now its home to Halifax. If the wind stays the same find the correct heading and time (you must find the total displacement to find the time).

14. Captain Bob has a boat that can travel in still water at a speed of 15.0 m/s. He wishes to travel from Renforth to Kennebecasis Park, which is at a bearing of 250°. If the current of the Kennebecasis is 5.0 m/s at 200°, a. find the bearing he must head and the resultant speed of the boat. b. If the distance from Renforth to Kennebecasis Park is 1.25 km, find the time to cross.

15. AB = 200 M at 037°, BC = 150 M at 150°, CD = 250 m at 325°. Find: a. vector AD, b. vector BD.

16. EF = 200 M at 120°, EG = 150 M at 180°, GH = 250 m at 240°. Find: a. vector EH, b. vector FH.

17. SR = 100 m @ 310^o; RT = 125 m @ 300^o; TW = 140 m @ 030^o.
Find the following vectors, SW and RW

18. GH = 300 m @ 053^o; HI = 200 m @ 160^o; IJ = 150 m @ 250^o.
Find the following vectors, HJ and JG

Write the vector equation that would solve the following:

19: AB, CB, CD, AE Find BD and DE 20. GH, HK, KL, GI Find GK and HI

21. XY, YW, WZ, XV Find VZ and WV 22. PQ, PS, TS, UT Find PT and SU