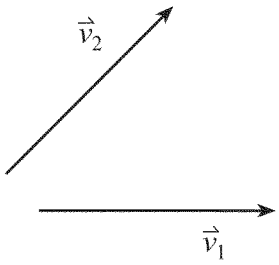
1. An airplane heads due north with an airspeed of 75 m/s. The wind is blowing due west at 18 m/s. What is the airplane's speed relative to the ground?

   A. 57 m/s
   B. 73 m/s
   C. 77 m/s
   D. 93 m/s

2. Two velocity vectors, v_1 and v_2 are shown.

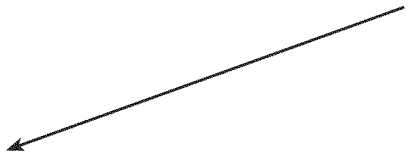


   Which of the following best represents the resultant of the addition of the two velocity vectors?

   A. 

   B. 

   C. 

   D. 

3. An aircraft heads due south with a speed relative to the air of 44 m/s. Its resultant speed over the ground is 47 m/s. The wind blows from the west.

   a) What is the speed of the wind? **(4 marks)**

   b) What is the direction of the aircraft's path over the ground? **(3 marks)**

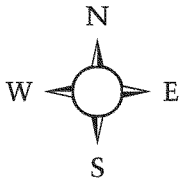
4. A car travelling north at 20 m/s is later travelling west at 30 m/s. What is the direction of the change in velocity?

A. 

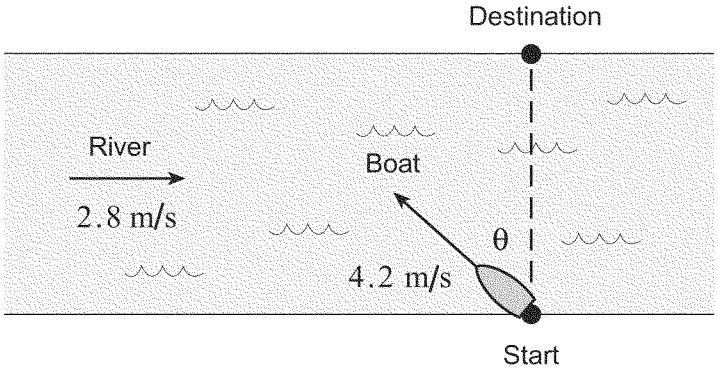
B. 

C. 

D. 



5. A boat shown below travels at 4.2 m/s relative to the water, in a river flowing at 2.8 m/s.



At what angle θ must the boat head to reach the destination directly across the river?

A. 34°
B. 42°
C. 48°
D. 56°