4A. A ship (pt B) is trying to travel in a north-west direction (45 degrees from North). The water current (pt A) is flowing due east with a velocity of 2 mph. The magnitude of the relative velocity of the ship to the current is 5 mph. Express the direction of the ship’s velocity vector relative to the water in unit vector form.

4B. At the instant shown below car A has a speed of 60 ft/s and is decelerating at a rate of 4 ft/s². Car B is on a curve traveling at 30 ft/s and its speed is increasing at a rate of 5 ft/s².
   a. Calculate the velocity vector of car A relative to car B. Express the velocity vector in unit vector form.
   b. Calculate the acceleration vector of car A relative to car B. Express the acceleration vector in unit vector form.
4C. A 650 N skier starts from rest on the slope shown below at t = 0. It takes him 3.5 sec to travel 30 m down the slope. Neglect wind resistance. Assume that the friction force between his skies and the snow is predicted using Coulomb’s law.
   a. Draw a FBD and Kinetic Diagram of the skier.
   b. Determine the friction force generated on his skies by the snow
   c. Calculate the coefficient of friction value between his skies and the snow.

4D. A crate A sits on the top surface of a wedge B. The angle of incline for the wedge is \( \theta = 40 \) degrees. The crate weighs 200 lb and the static coefficient of friction between the crate and the wedge surface is \( \mu_s = 0.5 \). The acceleration of the wedge and crate is \( a_B = 5 \text{ ft/sec}^2 \) up the slope.
   a. Draw a FBD and Kinetic Diagram of the crate.
   b. Solve for the friction force acting on the crate.
   c. Will the crate slide on the surface of the wedge? Explain!

4E. A car is traveling at 60 km/hr at the bottom of a hill when the driver applies the brakes, causing a speed reduction at the rate of 5 m/s\(^2\). A 2 kg package is sitting on the passenger seat. The seat cushion is set at an angle of \( \theta = 5 \) degrees from the horizontal as shown below. The coefficient of static friction is \( \mu_s = 0.2 \).
   a. Draw a FBD and Kinetic Diagram of the box.
   b. Solve for the friction force acting on the bottom of the box.
   c. Will the box slide on the surface of the seat? Explain!