

WS 9

Chapter 3 Practice Problems

1. A seal swims to an inlet with a speed of 5.0 m/s as a current of 1.0 m/s flows in the opposite direction. How long will it take the seal to swim 100. M? (25.0 s)
2. The movie "The Gods Must Be Crazy" begins with a pilot dropping a bottle out of an airplane. It is recovered by a surprised native below, who thinks it is a message from the gods. If the plane from which the bottle was dropped was flying at an altitude of 500. M, and the bottle lands 400. M horizontally from the initial dropping point, how fast was the plane flying when the bottle was released? (39.6 m/s)
3. Ferdinand the frog is hopping from lily pad to lily pad in search of a good fly lunch. If the lily pads are spaced 2.4 m apart, and Ferdinand jumps with a speed of 5.0 m/s, taking 0.60 s to go from lily pad to lily pad, at what angle must Ferdinand make each of his jumps? (37°)
4. Sarita sees a UFO from her bedroom window and calls to report it to the police. She says, "The UFO moved 20.0 m East, 10.0 m North, and 30.0 m West before it disappeared." What was the displacement of the UFO while Sarita watched? If the UFO completed these maneuvers in 12.9 seconds, what was its average velocity? Average speed? (veloc = 1.10 m/s @ 45° N of W, speed = 4.65 m/s)

5. While skiing, Ellen encounters an unexpected icy bump, which she leaves horizontally with a speed of 12.0 m/s. How far out, horizontally, from her starting point will Ellen land if she drops a distance of 7.00 m in the fall? (14.3 m)

6. The Amat count sheriff is trying to determine the speed of a car that slid off a small bridge on a snowy La Puente night and landed in a snow pile 4.00 m below the level of the road. The tire tracks in the snow show that the car landed 12.0 m measured horizontally from the bridge. How fast was the car going when it left the road? (13.3 m/s)

7. Superman is said to be able to leap tall buildings in a single bound. How high a building could Superman jump over if he were to leave the ground with a speed of 60.0 m/s at an angle of 75.0° to the horizontal? (171 m)

8. Quentin claims that he can throw a dart at a dartboard from a distance of 2.0 m and hit the 5.0 cm wide bulls-eye if he throws the dart horizontally with a speed of 15 m/s. He starts to throw the dart at the same height as the top of the bulls-eye. Check if Quentin is able to hit the bulls-eye by calculating how far his shot falls from the bulls-eye's height. 8.7 cm drop > 5.0 cm width \therefore NO