

PRACTICE E

Projectiles Launched at an Angle

1. In a scene in an action movie, a stuntman jumps from the top of one building to the top of another building 4.0 m away. After a running start, he leaps at a velocity of 5.0 m/s at an angle of 15° with respect to the flat roof. Will he make it to the other roof, which is 2.5 m lower than the building he jumps from?
2. A golfer hits a golf ball at an angle of 25.0° to the ground. If the golf ball covers a horizontal distance of 301.5 m, what is the ball's maximum height? (Hint: At the top of its flight, the ball's vertical velocity component will be zero.)
3. A baseball is thrown at an angle of 25° relative to the ground at a speed of 23.0 m/s. If the ball was caught 42.0 m from the thrower, how long was it in the air? How high above the thrower did the ball travel?
4. Salmon often jump waterfalls to reach their breeding grounds. One salmon starts 2.00 m from a waterfall that is 0.55 m tall and jumps at an angle of 32.0° . What must be the salmon's minimum speed to reach the waterfall?

SECTION REVIEW

1. Which of the following exhibit parabolic motion?
 - a. a flat rock skipping across the surface of a lake
 - b. a three-point shot in basketball
 - c. the space shuttle while orbiting Earth
 - d. a ball bouncing across a room
 - e. a life preserver dropped from a stationary helicopter
2. During a thunderstorm, a tornado lifts a car to a height of 125 m above the ground. Increasing in strength, the tornado flings the car horizontally with a speed of 90.0 m/s. How long does the car take to reach the ground? How far horizontally does the car travel before hitting the ground?
3. **Interpreting Graphics** An Alaskan rescue plane drops a package of emergency rations to a stranded party of explorers, as illustrated in **Figure 18**. The plane is traveling horizontally at 30.0 m/s at a height of 200.0 m above the ground.

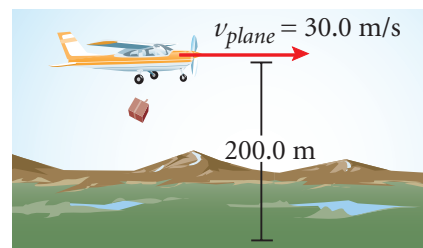


Figure 18

- a. What horizontal distance does the package fall before landing?
- b. Find the velocity of the package just before it hits the ground.