

1. Emanuel Zacchini, the famous human cannonball of the Ringling Bros. And Bernum & Bailey Circus, was fired out of a cannon with a speed of 24.0 m/s at an angle of 40.0° to the horizontal. If he landed in a net 56.6 m away at the same height from which he was fired, how long was Zacchini in the air?
2. Ferdinand the frog is hopping from lily pad to lily pad in search of a good fly for 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?
3. At her wedding, Jennifer lines up all the single females in a straight line away from her in preparation for the tossing of the bridal bouquet. She stands Kelly at 1.0 m, Kendra at 1.5 m, Mary at 2.0 m, Kristen at 2.5 m, and Lauren at 3.0 m. Jennifer tosses the bouquet behind her with a speed of 3.9 m/s at an angle of 50.0° to the horizontal, and it is caught at the same height 0.60 s later. Who catches the bridal bouquet?
4. 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?
5. An arrow is shot at 30.0° above the horizontal. Its velocity is 49 m/s and it hits the target. A) What is the maximum height the arrow will attain? B) The target is at the height from which the arrow was shot. How far away is it?

Sample Problem:

The ball in the strobe photo was launched with an initial velocity of 4.47 m/s at an angle of 66° above the horizontal.

- a) What was the maximum height the ball attained?
- b) How long did it take the ball to return to the launching height?
- c) What was its range?