# Projectile Motion - Quiz 5.0H

1. Our problem solving work with projectile motion assumes:
(a) there is significant air resistance (b) there is constant velocity in the horizontal direction (c) there is constant acceleration in the vertical direction (d) b and c (e) all of the above

2. If a bomb is dropped out of a plane flying horizontally at a constant speed, the bomb appears to:
(a) fall backward as the plane leaves it behind (b) fall straight down (c) fall forward in a parabolic path (d) b and c (e) all of the above are possible according to your point of view.

<u>For our problem solving work below assume negligible air resistance.</u>

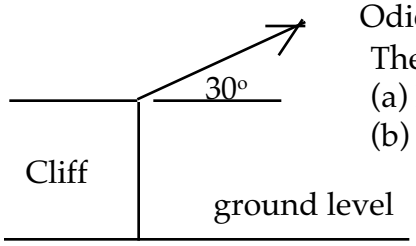
3. A basketball is rolled at 5 ft/s off a roof top 10 ft above the ground.
(a) How long is it in the air? (b) How far from the base of the building does it land?

4. A rugby ball is kicked from ground level with an initial speed of 20 m/s at a $20^o$ angle.
(a) How long is the ball in the air? (b) How far away does it land?

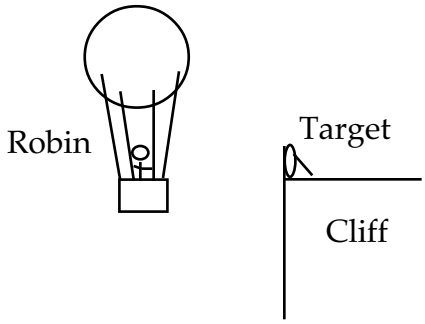
5. Nick is in an airplane flying horizontally with a speed of 805 km/h (or 224 m/s). The plane's altitude is 10,000 m and Nick accidentally falls out of the plane. By chance there is a newly fertilized lawn 10 km away (along the ground) straight ahead. Will Nick land in it?

6. A soccer ball is kicked with an initial speed of 30 m/s at a $37^o$ angle with the ground.
(a) How far does the ball travel horizontally? (b) What is the ball's maximum height?

7. Odie is sent flying at a 30 degree angle above the horizontal. The cliff is 14.7 m high and his initial speed is 19.6 m/s.
(a) How long is Odie in the air?
(b) How far from the base of the cliff does he land?




8. Robin Hood is riding in a balloon which is rising at 48 ft/s. (This is an American movie star.) He spots a target 200 ft away on the top of a cliff. Robin aims horizontally and fires his usual 100 ft/s arrow.
(a) Does it hit the target? (b) Where does the arrow land?




9. A tennis ball is tossed horizontally off a cliff at 10 m/s. It lands 50 m from the base of the cliff. What is the height of the cliff?

10. A truck is moving down a straight road at 40 m/s with a cannon aimed vertically upward. The muzzle speed of the cannon ball is known to be 30 m/s.
(a) If the cannon is fired while the truck is moving, how long is the ball in the air?
(b) How far does the truck travel before it explodes?
(c) What is the initial speed and (angular) direction of the cannon ball according to a person viewing all of this from the side of the road?