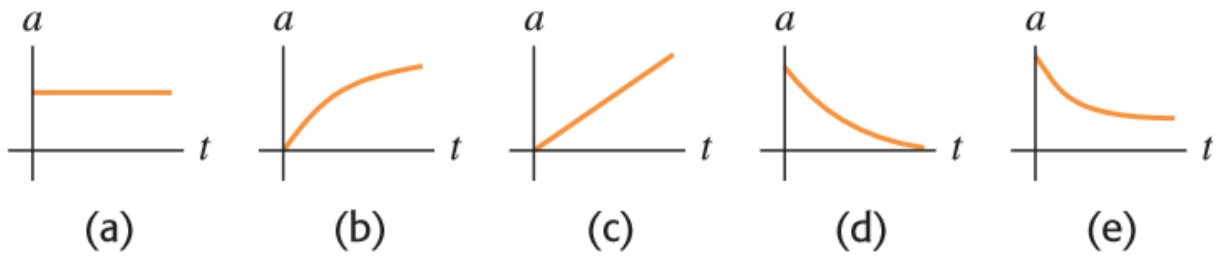
Quiz

Q1: A ball is dropped from rest and feels air resistance as it falls. Which of the graphs in Fig. best represents its acceleration as a function of time?

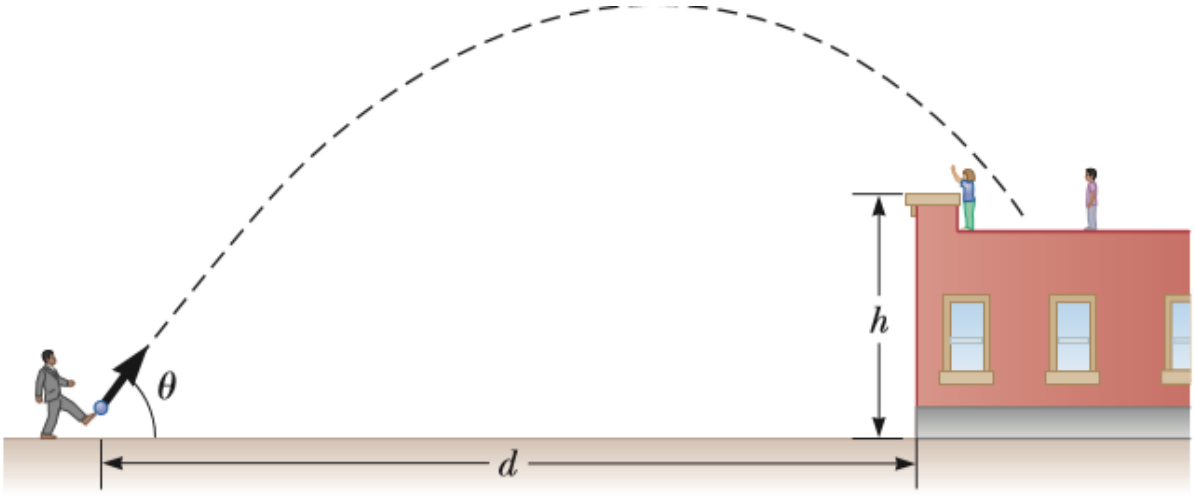


Q2: A projectile moves in a parabolic path without air resistance. Is there any point at which acceleration is parallel to velocity (resultant) or Perpendicular to Explain with diagram?

Q3: A falling skydiver reaches terminal speed with her parachute closed. After the parachute is opened, what parameters change to decrease this terminal speed?

Q4: A flat (unbanked) curve on a highway has a radius of 220.0 m. A car rounds the curve at a speed of 25 m/sec (a) what is the minimum coefficient of friction that will prevent sliding? (b) Suppose the highway is icy and the coefficient of friction between the tires and pavement is only one-third what you found in part (a). What should be the maximum speed of the car so it can round the curve safely?

Q5: A playground is on the flat roof of a city school, 6.00 m above the street below. The vertical wall of the building is h = 7.00 m high, forming a 1-m-high railing around the playground. A ball has fallen to the street below, and a passerby returns it by launching it at an angle of $\theta = 53.0°$ above the horizontal at a point d = 24.0 m from the base of the building wall. The ball takes 2.20s to reach a point vertically above the wall. (a) Find the speed at which the ball was launched. (b) Find the vertical distance by which the ball clears the wall.



Q6: A soccer player kicks a rock horizontally off a 45.0-m-high cliff into a pool of water. If the player hears the sound of the splash 3.10 s later, what was the initial speed given to the rock? Assume the speed of sound in air is 343 m/s.

Q7: Consider a conical pendulum with a bob of mass m = 100.0 kg on a string of length L = 8.0 m that makes an angle of $\theta = 5.00^0$ with the vertical. Determine (a) the horizontal and vertical components of the force exerted by the string on the pendulum and (b) the radial acceleration of the bob.