

Chapter 2 Motion Along a Straight Line

Example 1:

If a car starts from rest and accelerates at 8.00 m/s^2 . How much time elapses before its speed is 30.0 m/s ?

Example 2:

A car moving at 30.0 mph stops in a distance of 2.00 ft . Calculate its acceleration.

Example 3:

Mary runs 100 m in 10.2 s . If she starts from rest calculate her acceleration. (assume constant acceleration)

Example 4:

A car's initial location is 145 ft from an intersection. Its initial velocity is 60.0 mph toward the intersection. The car slows at a rate of 16.0 ft/s^2 . How long before the car reaches the intersection?

Example 5:

A truck traveling at a constant 45.0 mph passes a stationary car just as the car starts forward with an acceleration of 20.0 ft/s^2 . How far does the car travel before catching the truck?

Example 6:

(a) Calculate the time a rock takes to reach its maximum height if it is thrown up at 65.8 ft/s . (b) What is this maximum height?

Example 7:

While standing at the edge of a 50.0 m high cliff a child throws a rock straight up at 15.0 m/s . (a) How fast is it going the instant before it hits the ground? (b) Later the same child throws another rock straight down at 15.0 m/s . What speed does it have when it strikes the ground?

Example 8:

At the NASA research center free-fall experiments are performed in a 145 m tall evacuated shaft. The experimental packages drop for 5.18 s . (a) How far do the packages drop in this time? (b) What acceleration is required to stop the packages in the remaining distance?

Example 9:

A hot air balloon is rising at 12.4 ft/s when a camera falls over the side. How long does it take the camera to hit the ground if it starts falling when the balloon is 36.2 ft above the ground?

Example 10:

A stunt person jumps off of a 60.0 ft high cliff and falls 45.0 ft before colliding with an air bag. What acceleration does she experience while stopping if she stops in 12.0 ft ?

Example 11:

A rocket accelerates upward at $12.5 \text{ g}'\text{s}$. Its fuel runs out after 2.75 s . The rocket continues upward until it reaches its maximum height above its launch point. Calculate the maximum height.