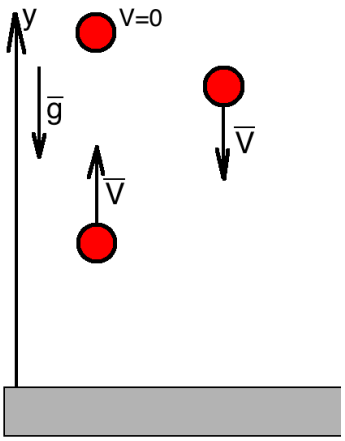
you toss a small ball vertically up in the air how are the velocity and acceleration vector of the ball oriented with respect to one another during the balls flight up and down ?

Solution:



Acceleration of the gravity is always constant in magnitude and direction - straight down to earth.

During the flight up, direction of the speed of ball is upwards and acceleration - down (deceleration). When the ball reaches the top point of the trajectory (zero speed), it does not apply velocity and acceleration only acts.

During the flight down the velocity and acceleration have the same direction (acceleration), that is, the speed of the ball increases due to the acceleration. While falling to the ground speed of the ball will be the same as before the throw (if we ignore air resistance).