

Suppose you drop a rock from a height of 100 m. How far does the rock travel in the last 3 seconds before it hits the ground?

You drop a rock from a height h the same moment your friend throws a rock upward at speed v . When the rocks collide, the falling rock has 4 times the instantaneous velocity of the upwardly moving thrown rock. What height, h_{collide} , did the collision occur?

A quarterback notices that a defensive lineman is bearing down on him. At $t=0$, the lineman has a position of $x = -10$ m, velocity of 10 m/s. The quarterback needs to buy 1.5 second with his legs, if he starts accelerating at 5 m/s^2 , can he buy this extra time?

Suppose the position of a particle is given by $x(t) = 6t^2 - 10t + 5$ m. What is the instantaneous velocity?
What is the acceleration?

Suppose I tell you that the acceleration of a particle is given by $a(t) = 4t^3 - 6t^2$ m/s². (a) find its velocity as a function of time assume that at $t = 0$, it had a velocity of -6 m/s (b) Find its position as a function of time if it starts out at $x=0$?