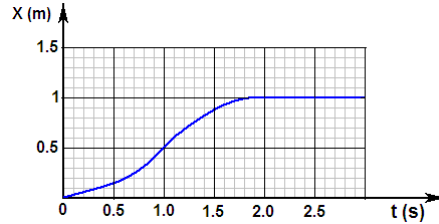


Physics I

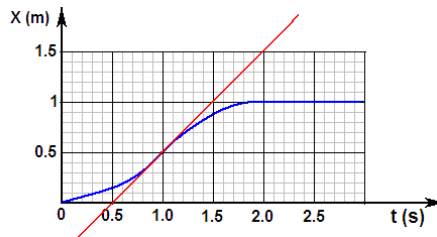
Velocity Graphical

Problem 1.- The figure describes the motion of a particle. Estimate its maximum velocity (in m/s) and indicate at what time it happens.

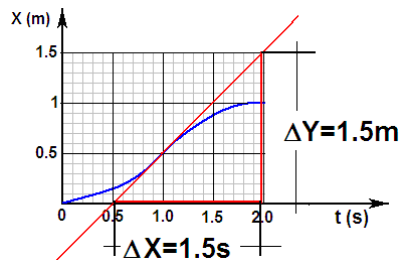


Solution: The maximum velocity happens when the slope of the tangent is maximum. By looking at the graph we find that it happens at **$t=1.0$ s**

To get the velocity we can draw a tangent at that point as follows:

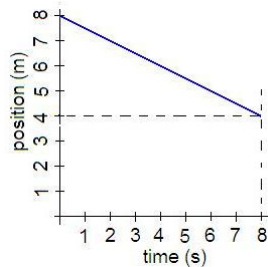


And find the slope by dividing $\Delta y / \Delta x$:

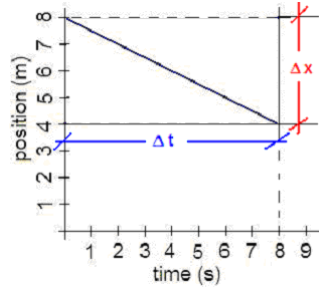


$$\text{So } v = \frac{\Delta y}{\Delta x} = \mathbf{1\text{m/s}}$$

Problem 2.- In the following figure determine the instantaneous velocity and acceleration when the time is $t = 4$ s.

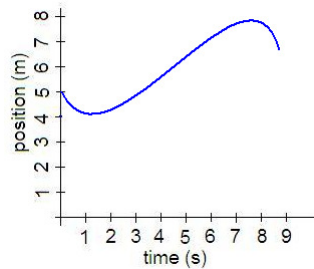


Solution: The slope of the curve gives us the velocity: $v = \frac{\Delta x}{\Delta t} = \frac{-4m}{8s} = \mathbf{-0.5\ m/s}$

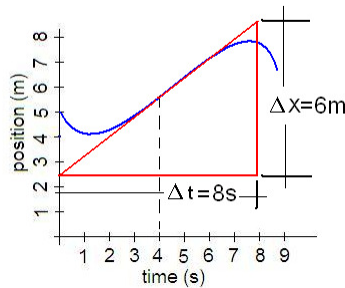


We notice that the slope is constant, meaning that **the acceleration is zero.**

Problem 3.- In the following figure estimate the instantaneous velocity at $t = 4\ s$.



Solution: To find the velocity we draw a right triangle using the tangent to the curve as our hypotenuse:



We get the instantaneous velocity by calculating the slope: $v = \frac{6m}{8s} = \mathbf{0.75m/s}$