1- A stone is thrown <u>downward</u> from height (h) above the ground with an initial speed of 10 m/s. It strikes the ground 3 seconds later. Determine the height (h).

④

$v_0 = -10 \frac{m}{s}$

$t = 3 \ s$

$h = ?!$
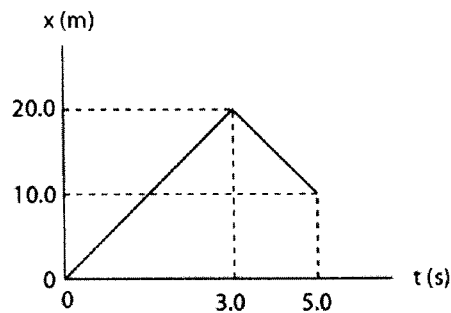
$a = -g$

use $h = \Delta y = v_0 t + \frac{1}{2} a t^2$

$\Delta y = (-10)(3) - \frac{1}{2}(9.8)(3)^2 = -30 - (4.9)(9)$

$\simeq -74 \ m$

$\boxed{h = 74 \ m}$

2- The figure shows the position-time graph of an object. What is the average velocity of the object between t=0 s and t= 5 s?

$v_{avg} = \frac{\Delta x}{\Delta t} = \frac{10 - 0}{5 - 0} = 2 \ \frac{m}{s} \ .$

③

3- The position x of a particle is given by $x = Bt^2 + \frac{C}{B}t$, where x is in meters and t is in seconds. What is the dimension of C?

③

each term should have the same dimension = [L]

$L = B T^2 + \frac{C}{B} T$

$B T^2 = L \Rightarrow \boxed{B = \frac{L}{T^2}}$

$\frac{C}{B} T = L \Rightarrow C = \frac{L}{T} B = \frac{L}{T} \cdot \frac{L}{T^2}$

$\Rightarrow \boxed{C = \frac{L^2}{T^3}}$