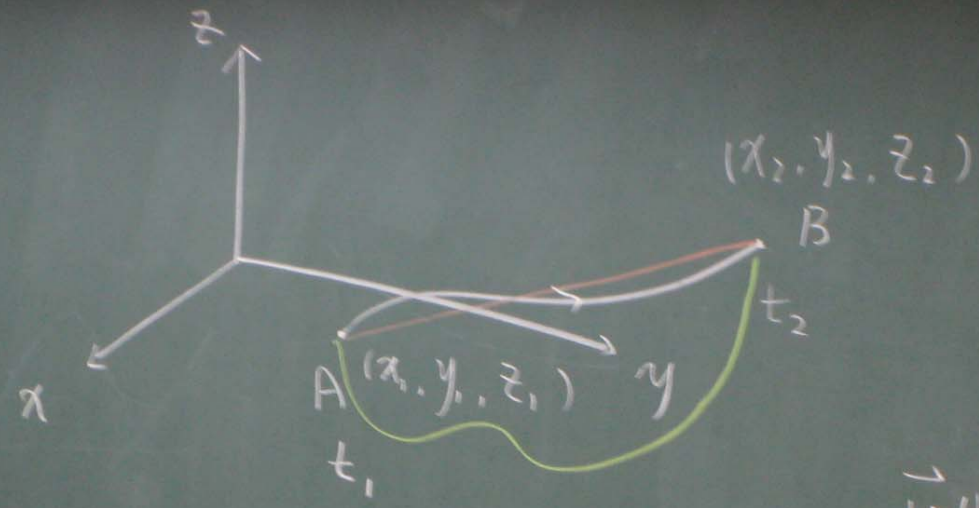


$$\vec{r}(t) = x(t)\,\hat{x} + y(t)\,\hat{y} + z(t)\,\hat{z}$$

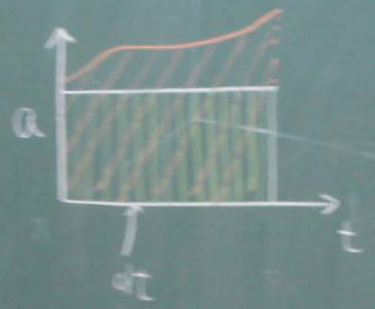
$$\vec{v}(t) = \lim_{\Delta t \to 0} \frac{\vec{r}(t+\Delta t) - \vec{r}(t)}{\Delta t} = \frac{d\vec{r}}{dt}$$

$$\vec{a}(t) = \lim_{\Delta t \to 0} \frac{\vec{v}(t+\Delta t) - \vec{v}(t)}{\Delta t} = \frac{d\vec{v}}{dt}$$

$$\vec{r}(t) \longrightarrow \vec{v}(t) \longrightarrow \vec{a}(t)$$

$$\vec{a}(t) \xrightarrow{?} \vec{v}(t) \xrightarrow{?} \vec{r}(t)$$

a：常数



$v(t) - v_0 = at$

$v(t) = v_0 + at$; $x(t) = x_0 + v_0 t + \frac{1}{2} a t^2$

$v(t) - v_0 = at$

$t = \frac{v(t) - v_0}{a}$

$x(t) - x_0 = v_0 t + \frac{1}{2} a t^2$

$= v_0 \frac{v(t) - v_0}{a} + \frac{1}{2} \left[\frac{v(t) - v_0}{a} \right]^2$

$3 = 3 \times 1$

$$\vec{v}(t) = \frac{dx}{dt}\hat{x} + \frac{dy}{dt}\hat{y} + \frac{dy}{dt}\hat{z} = v_x\hat{x} + v_y\hat{y} + v_z\hat{z}$$

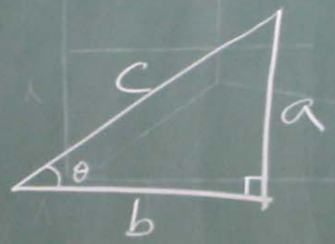
$$\vec{a}(t) = \frac{dv_x}{dt}\hat{x} + \frac{dv_y}{dt}\hat{y} + \frac{dv_z}{dt}\hat{z} = a_x\hat{x} + a_y\hat{y} + a_z\hat{z}$$

$f(x) = ax^2 + C$ $\quad -\frac{1}{2}ax_1^2 - \frac{1}{2}ax_0^2$ $\quad \frac{df(x)}{dx} = 2ax$ $\quad \frac{1}{2}ax^2$

$$2a\left[x(t) - x_0\right] = 2v_0\left[v(t) - v_0\right] + v^2(t) - 2v_0v(t) + v_0^2$$

$$= v^2(t) - v_0^2$$

$$2a\left[x(t) - x_0\right] = v^2(t) - v_0^2 \qquad v_0 \equiv 0$$



$$\sin\theta = \frac{a}{c}$$

$$\cos\theta = \frac{b}{c}$$

$$\tan\theta = \frac{a}{b}$$

$$\frac{h}{x+120} = \tan 19^\circ = 0.3443$$

$$\Rightarrow h = 0.3443(x+120) \leftarrow$$

$$\frac{h}{x} = \tan 47^\circ = 1.0724$$

$$\Rightarrow h = 1.0724x \leftarrow$$

$$h = 0.3443x + 0.3443 \times 120$$

$$\Rightarrow x = \frac{0.3443 \times 120}{1.0724 - 0.3443} = \frac{41.32}{0.7281} = 56.744$$

$$h = 60.85\text{m}$$