$l_1 = x_1 = 3{,}20$ m $\quad 3{,}20$ m

$l_2 = x_2 = 2{,}73$ cm $\rightarrow 0{,}0273$ m

$x_1 + x_2$ $\quad 3{,}2273$ m ??

$3{,}23$

$A = l_1 \times l_2 = 8{,}736 \cdot = 0{,}08736$ m^2

$\simeq$

$\rightarrow 8{,}74\ m^2 = 0.0874\ m^2$

$= 8736\ cm^2$

$\equiv$

$874\ cm^2$

$\equiv 87360\ mm^2$??

$(874) \times 100\ mm^2$

$8{,}74 \times 10^4\ mm^2$

!

$8{,}74 \times 10^{-2}\ m^2$

$2 \times \ell$ ↑ Esatto!

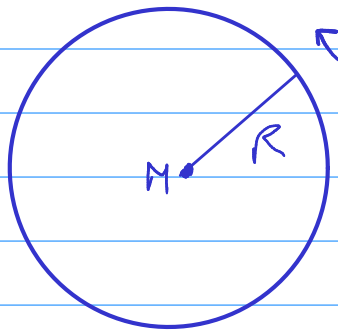
$\pi \cdot R$ ↓ $3,14$ $3,1416$

$a = \omega^2 R$ ← in modulo!

$= \left(\frac{2\pi}{T}\right)^2 \cdot R = \frac{(2\pi)^2}{T^2} \cdot R \cdot \frac{R}{R}$

$= \left(\frac{2\pi R}{T}\right)^2 \cdot \frac{1}{R}$

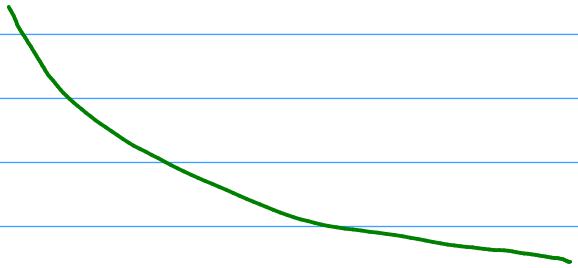
$= \frac{v^2}{R}$



$\frac{m v^2}{R} = \frac{GM}{R^2} m$

$v^2 = \frac{GM}{R}$

$v = \frac{\sqrt{GM}}{\sqrt{R}} \propto \frac{1}{\sqrt{R}}$ $\left(\propto \sqrt{M}\right)$



LANCIO DI OGGETTI

$$\vec{F} = (0, -mg)$$

$g \simeq 9{,}8\ m/s^2 \quad \left(\frac{m/s}{s}\right)$

$$\vec{a} = \frac{\vec{F}}{m} = (a_x, a_y) = (0, -g)$$

$$\vec{s}_0 = (x_0, y_0) = (0, 0)$$

$$\vec{v}_0 = (v_{x_0}, v_{y_0}) = (0, v_{y_0})$$

A) x: $x_0 = 0$, $v_{0x} = 0$ $(v_{x_0} = 0)$, $a_x = 0$ $\Rightarrow x(t) = 0$ $\forall t$

$a_y = -g$ $\forall\, t$ ✓ ✓

$$\Delta v_y\Big|_{t_1}^{t_2} = \int_{t_1}^{t_2} a_y(t)\,dt = \int_{t_1}^{t_2} (-g)\,dt$$

$$= -gt\Big|_{t_1}^{t_2}$$

$$= -g(t_2 - t_1)$$

$$\Delta v_y\Big|_0^t = \int_0^t a_y(t')\,dt'$$

$$\Delta v_y\Big|_0^t = -g(t - 0) = -gt$$

$$v_y(t) - \underbrace{v_y(0)}_{v_{y0}} = -gt$$

$$v_y(t) = v_{y0} - gt$$

$$v_y(t) = 0 \Rightarrow t = \frac{v_{y0}}{g}$$

$$x(t) = x\left(\frac{v_{y0}}{g}\right)$$

$$\Delta y\Big|_0^t = \int_0^t \underbrace{v_y(t')\,dt'}_{dy} = \int_0^t (v_{y_0} - g t')\,dt'$$

$$= \left(v_{y_0} \cdot t' - \frac{1}{2} g t'^2 \right)\Big|_0^t$$

$$= v_{y_0}\, t - \frac{1}{2} g t^2$$

$$y(t) - y(0)$$

$$y(t) - y_0 =$$

$$\boxed{y(t) = y_0 + v_{y_0} \cdot t - \frac{1}{2} g t^2}$$

$v_{x_0} \neq 0 \quad \geq 0$ $\quad (a_x = 0\ !)$

$$v_x(t) = v_{x_0}$$

$$x(t) = x_0 + v_{x_0} \cdot t$$

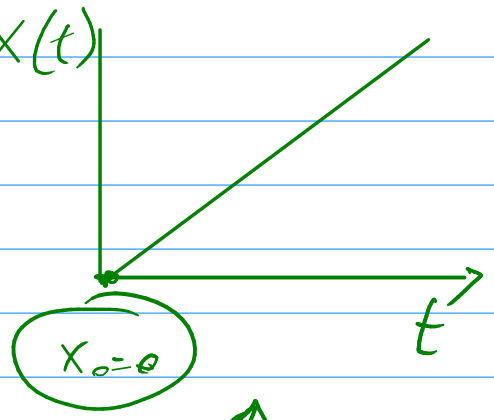


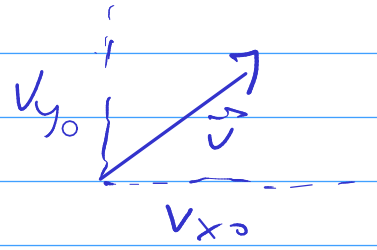
GRAFICO ORARIO

Eq. oraria:

Equation of motion:

$$\begin{cases} x(t) \\ y(t) \end{cases}$$

$$\vec{V}_0 = (V_{x0}, V_{y0})$$



$t = t(x)$

$y = y(x)$ trajectory