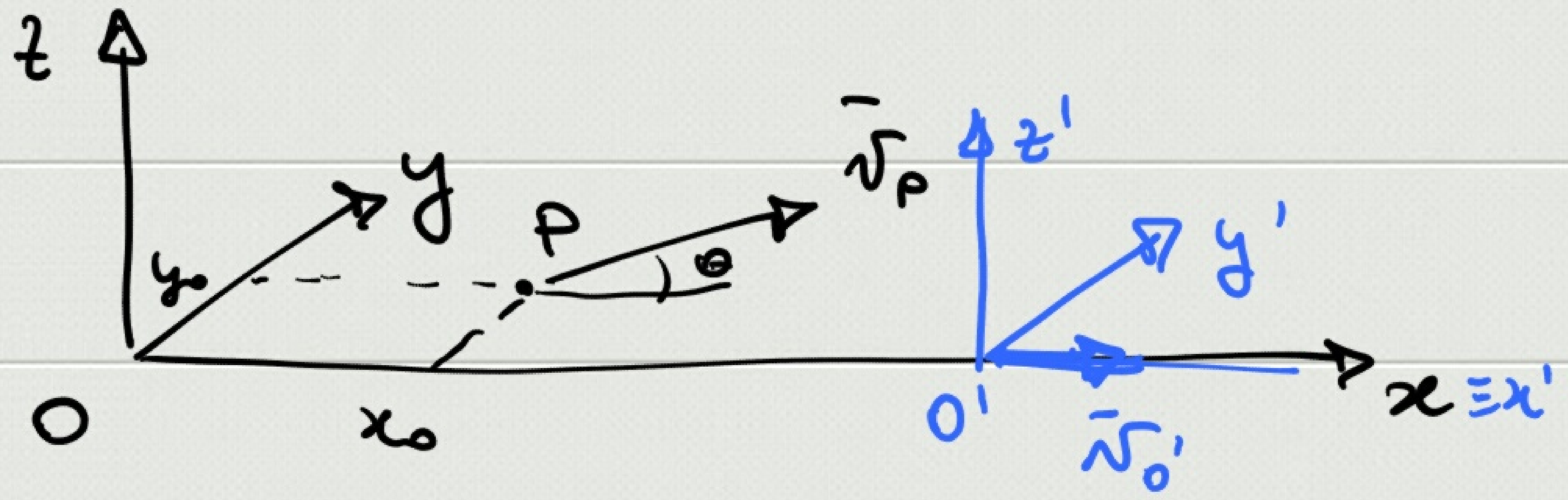
$$\begin{cases} \bar{r}' = \bar{r} - \bar{r}_{O'} & * \\ \bar{v}' = \bar{v} - \bar{v}_{O'} - \bar{\omega} \times \bar{r}' & \Leftarrow \\ \bar{a}' = \bar{a} - \bar{a}_{O'} - \bar{\omega} \times (\bar{\omega} \times \bar{r}') - \dfrac{d\bar{\omega}}{dt} \times \bar{r}' - 2\,\bar{\omega} \times \bar{v}' \end{cases}$$



$P = (x_0, y_0, 0)$

$\bar{v}_P = (v_x, v_y, 0)$

è costante

$v = \sqrt{v_x^2 + v_y^2}$ $\qquad \theta = \operatorname{arctg}\left(\dfrac{v_y}{v_x}\right)$

$\bar{r}(t) = \bar{r}_0 + \bar{v}\,t \quad \Longrightarrow \quad \begin{cases} x(t) = x_0 + v_x t \\ y(t) = y_0 + v_y t \end{cases}$

$t = 0 \; : \quad O \equiv O'$ $\qquad \bar{v}_{O'} = v_{O'}\,\bar{u}_x$

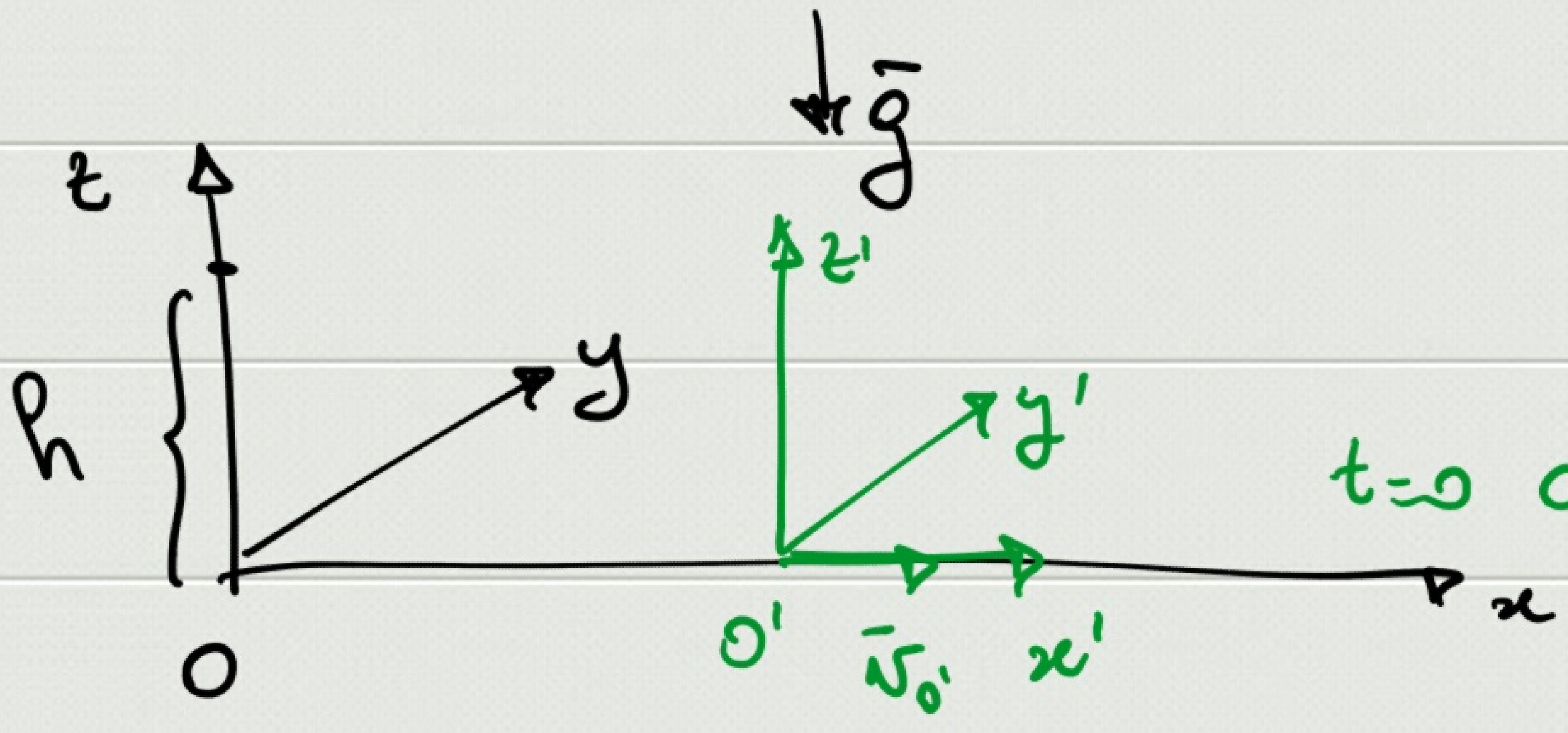
$x_{O'}(t) = v_{O'}\,t \quad \Leftarrow \bar{r}_{O'}$

$$\bar{r}' = \bar{r} - \bar{r}_{O'} = \begin{cases} x'(t) = (x_0 + v_x t) - v_{O'} t = x_0 + (v_x - v_{O'})t \\ y'(t) = (y_0 + v_y t) \end{cases}$$

$\Uparrow$

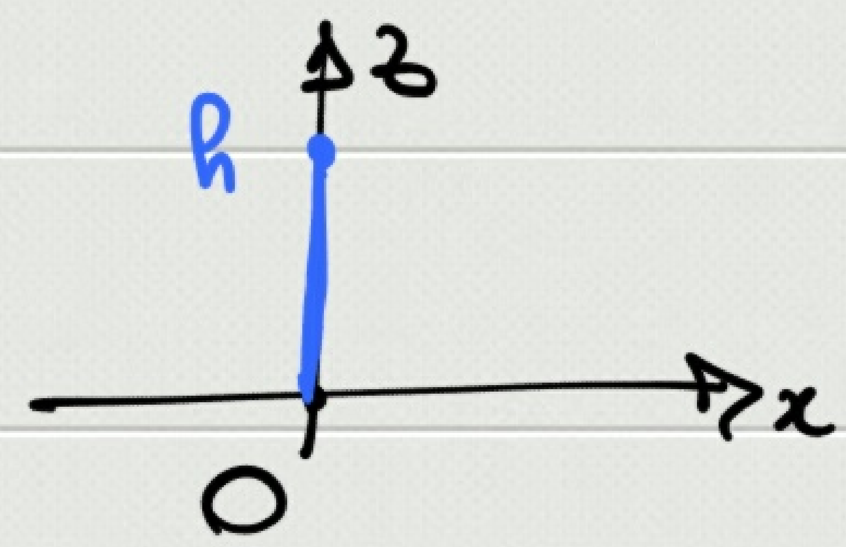
$\bar{v}' = (v_x - v_{O'})\,\bar{u}_x + v_y\,\bar{u}_y$

$v' = \sqrt{(v_x - v_{O'})^2 + v_y^2} \neq v \qquad \theta' = \operatorname{arctg}\dfrac{v_y}{v_x - v_{O'}}$



$v_O = 0$

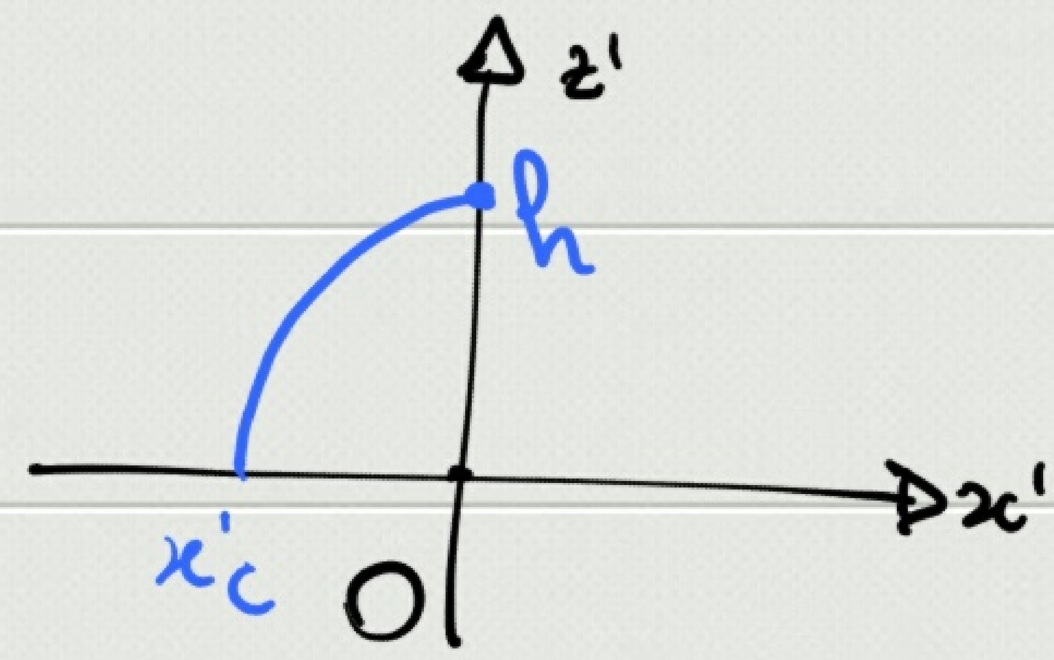
$t=0 \quad O \equiv O' \quad \bar v_{O'} = v_{O'} \bar u_x$

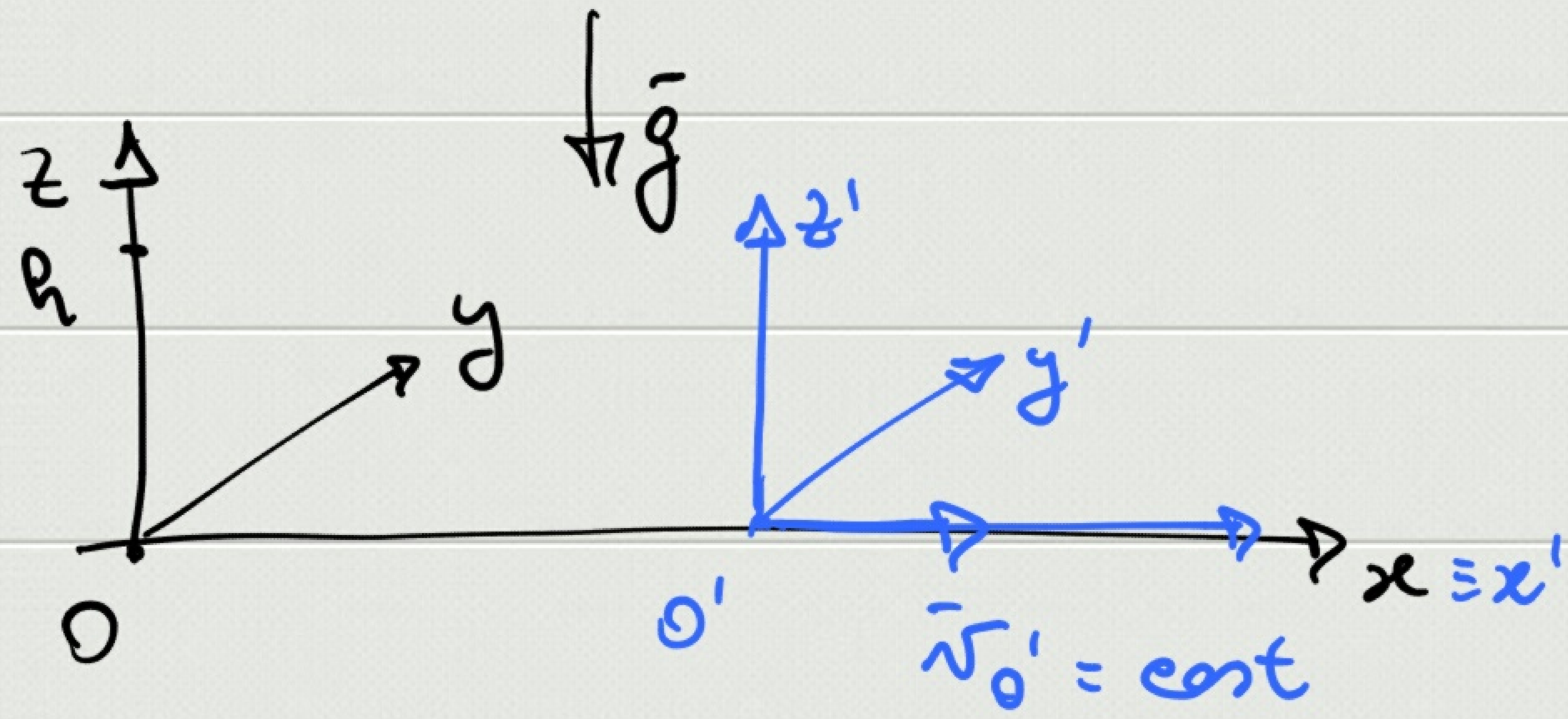


$$z(t) = h - \frac{1}{2} g t^2$$

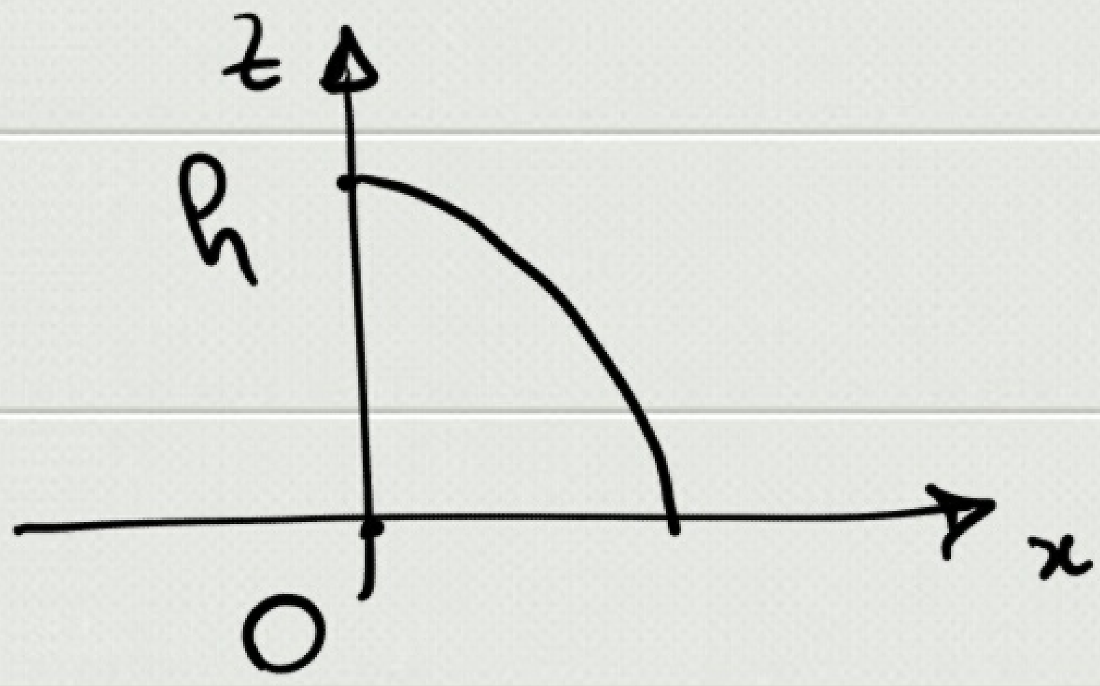
$$\bar r' = \bar r - \bar r_{O'} \qquad \bar r_{O'} \Rightarrow x_{O'} = v_{O'} t$$

$$\Rightarrow \begin{cases} x'(t) = -v_{O'} t \\ z'(t) = h - \frac{1}{2} g t^2 \end{cases}$$

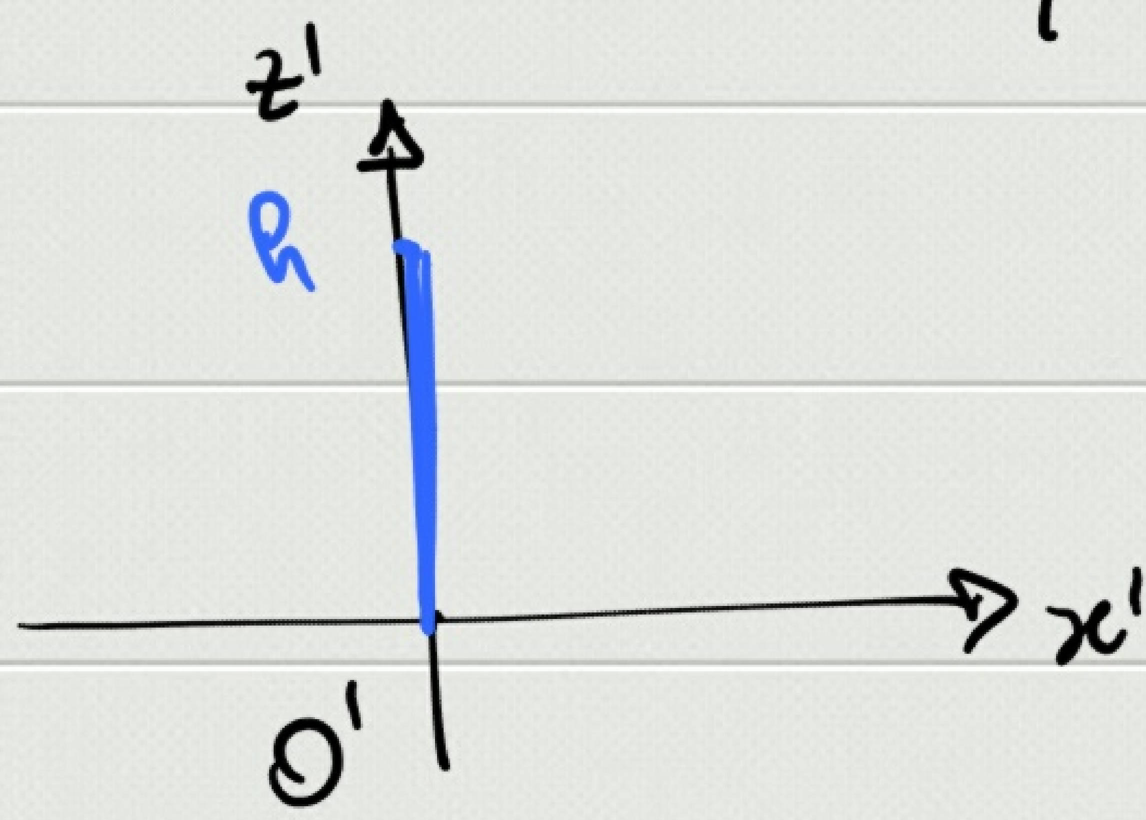


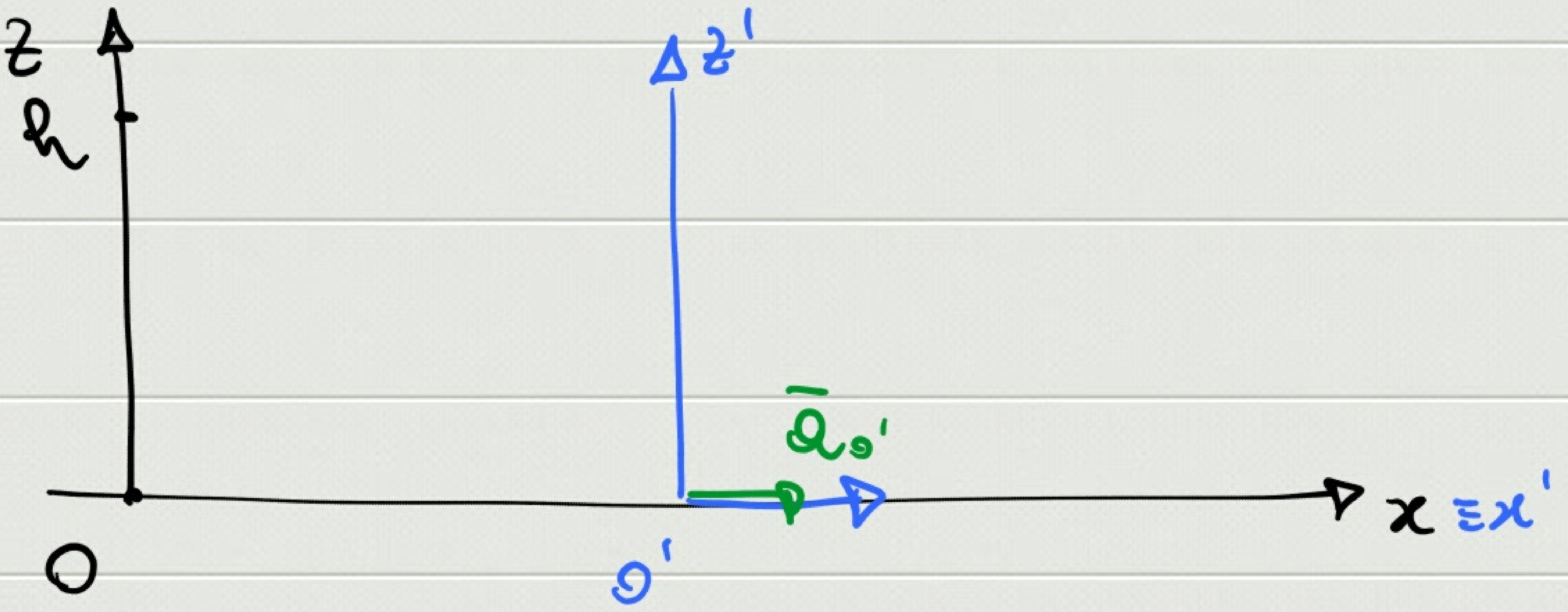


$$\bar{r}(t) = \bar{r}_0 + \bar{v}_0 t + \frac{1}{2}\bar{a}t^2 \Rightarrow \begin{cases} x(t) = v_{0'}t \\ z(t) = h - \frac{1}{2}gt^2 \end{cases}$$



$$\bar{r}'(t) = \bar{r} - \bar{r}_{0'} \Rightarrow \begin{cases} x'(t) = v_{0'}t - v_{0'}t = \emptyset \\ z'(t) = h - \frac{1}{2}gt^2 \end{cases}$$





$$\bar r_{o'} = \cancel{\emptyset} + \bar v_{o',\emptyset}\, t + \frac{1}{2}\bar a_{o'} t^2$$

$$\Rightarrow \quad x_{o'}(t) = v_{o',\emptyset}\, t + \frac{1}{2} a_{o'} t^2$$

$$\bar r(t) = \bar r_0 + \bar v_0 t + \frac{1}{2}\bar a t^2 \Rightarrow \begin{cases} x(t) = v_{o',\emptyset}\, t \\ z(t) = h - \frac{1}{2} g t^2 \end{cases} \qquad \circledast$$

$$\bar r'(t) = \bar r(t) - \bar r_{o'}(t) \Rightarrow \begin{cases} x'(t) = \cancel{v_{o',\emptyset}\, t} - \cancel{v_{o',\emptyset}\, t} - \frac{1}{2} a_{o'} t^2 \\ z'(t) = h - \frac{1}{2} g t^2 \end{cases}$$

$$t^2 = -\frac{2x'}{a_{o'}} \quad \Rightarrow \quad z'(x') = h + \frac{1}{\cancel{2}} g \frac{\cancel{2}x'}{a_{o'}} = h + \frac{g}{a_{o'}} x'$$