9) $\Delta t = 10s$ $\quad a = \frac{\Delta v}{\Delta t}$ $\quad \Delta s = \frac{1}{2} a \Delta t^2 + v_i \Delta t$

$\Delta s = 100m$

$a = ?$

$v_i = ?$

$100 = \frac{1}{2} \cdot a \cdot 10^2 + v_i \cdot 10$

$100 = \frac{1}{2} a \cdot 100 + v_i \cdot 10$

$100 = \frac{1}{2} \frac{\Delta v}{\Delta t} \cdot 100 + v_i \cdot 10$

$100 = \frac{1}{2} \frac{v_f - v_i}{10} \cdot 100 + v_i \cdot 10$

$100 = \frac{v_f + v_i}{2} \cdot 10$

$20m/s = v_f + v_i$

$v_i = 20 m/s$

$a = \frac{\Delta v}{\Delta t} = \frac{v_f - v_i}{10s} = \frac{v_f - 20m/s}{10s} = \frac{0m/s - 20m/s}{10s}$

$a = -\frac{20m/s}{10s} = -2m/s^2$

9) $\Delta s = 100\,m$

$\Delta t_A = 10\,s$

$\Delta s_B = 95\,m$ in $10\,s$

$\Delta s_A = 105\,m$

$\Delta s_{B2} = 100\,m$

CHI VINCE?

$v_A = \frac{100\,m}{10\,s} = 10\,m/s \qquad \Delta s = v \cdot \Delta t$

$v_B = \frac{95\,m}{10\,s} = 9{,}5\,m/s$

$\Delta t_A = \frac{\Delta s_A}{v_A} = \frac{105\,m}{10\,m/s} = 10{,}5\,s$

$\Delta t_B = \frac{\Delta s_B}{v_B} = \frac{100\,m}{9{,}5\,m/s}$

10) $\Delta s = 20\ Km$
$t_1 = 7:20\ h$
$v_1 = 72\ Km/h$
$t_2 = 7:30\ h$
$v_2 = 108\ Km/h$
$t_3 = 7:45\ h$
$V_3 = 0\ Km/h$
$V_4 = 90\ Km/h$

1 COSTRUIRE IL GRAFIC POSIZIONE-TEMPO

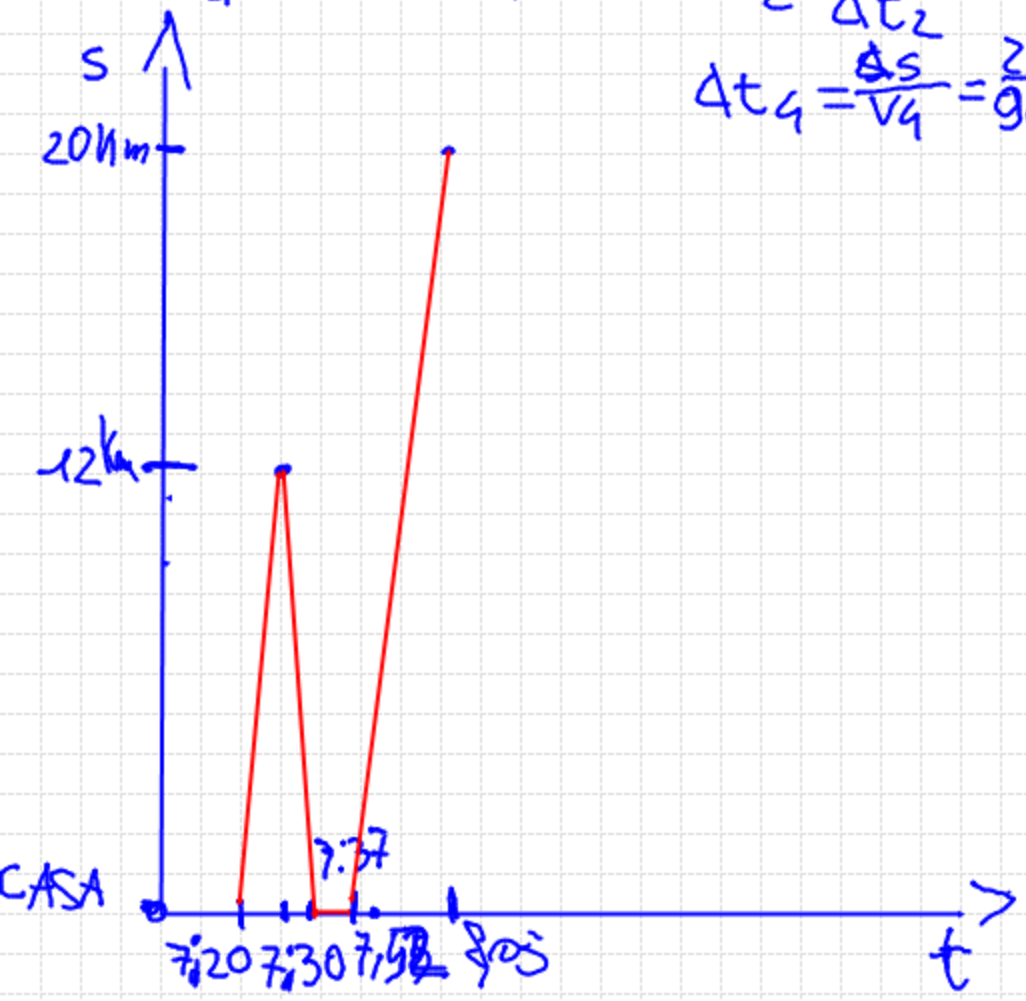
2 STABILIRE SE IL PROF. ARRIVA IN TEMPO A SCUOLA (8:00 h)

$s_1 = v_1 \cdot \Delta t_1 \quad s_1 = 72\ Km/h \cdot 10\ min$

$s_1 = \frac{72\ Km}{h} \cdot \frac{1}{6}\ h = 12\ Km$

$v_2 = \frac{s_1}{\Delta t_2} \quad \Delta t_2 = \frac{s_1}{V_2} = \frac{12\ Km}{108\ \frac{Km}{h}} = 0,1\ h = 7\ m$

$\Delta t_4 = \frac{\Delta s}{V_4} = \frac{20\ Km}{90\ Km/h} = 0,2\ h = 13\ m$



8)

$S_1 = 6\ Km$

$V_1 = 80\ Km/h$

$S_2 = 6\ Km$

$V_2 = 120\ Km/h$

$V_m = ?$

$t_1 = \frac{6\ Km}{80\ Km/h} = 0{,}075\ h = 0\ h + 0{,}075 \times 60\ min =$

$= 0\ h + 4{,}5\ min = 0\ h + 4\ min + 0{,}5 \times 60\ s =$

$= 4\ min\ 30\ sec = 270\ sec$

$t_2 = \frac{6\ Km}{120\ \frac{Km}{h}} = 0{,}05\ h = 0\ h + 0{,}05 \cdot 60\ min =$

$= 0\ h + 3\ min = 180\ sec$

$V_m = \frac{S_1 + S_2}{t_1 + t_2} = \frac{12\ Km}{450\ s} = 26{,}7\ m/s = 96\ Km/h$

12)

$v_F = 100\,km/h = 27{,}8\,m/s$

$\Delta t_F = 6\,s$

$v_G = 90\,km/h$

$\Delta s_G = 75\,m$

$$a = \frac{\Delta v}{\Delta t} = \frac{27{,}8\,m/s - 0\,m/s}{6\,s} =$$

$$= \frac{27{,}8\,m/s}{6\,s} = 4{,}6\,m/s^2$$

$$v_f^2 - v_i^2 = 2a \cdot \Delta s$$

$$(90\,km/h)^2 - 0 = 2a \cdot 75\,m$$

$$625\,m^2/s^2 = 2a \cdot 75\,m$$

$$a = 4{,}2\,m/s^2$$

13) $v_1 = 126\ km/h$

$\Delta s = 140\ m$

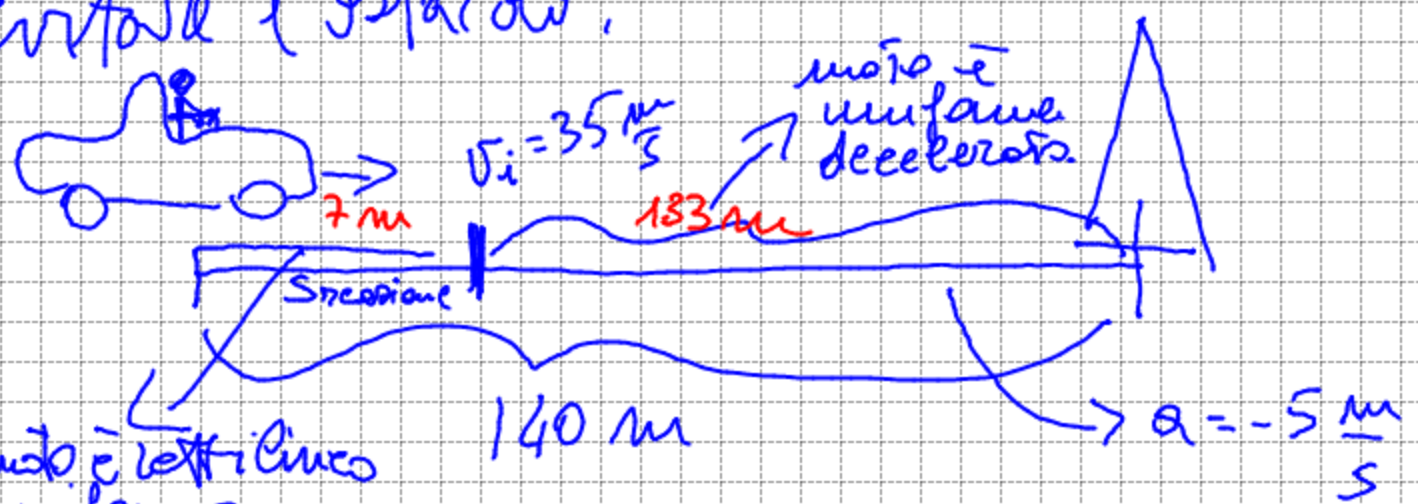
$\Delta t_{REAZIONE} = 0,25$

$a = -5\ m/s^2$

$s_{REAZIONE} = v_i \cdot \Delta t_{REAZIONE}$

$v_1 = \frac{126}{3,6}\ m/s = 35\ m/s$

Se la fa a evitare l'ostacolo?



$s_{REAZIONE} = 35\ m/s \cdot 0,2\ s = 7\ m$

$v_f^2 - v_1^2 = 2a(\Delta s)$ $\quad \Delta s = \frac{v_f^2 - v_i^2}{2a}$

$v_f = 0$

$\Delta s = \frac{0 - \left(35\ \frac{m}{s}\right)^2}{2\left(-5\ \frac{m}{s^2}\right)} = \frac{-1225\ \frac{m^2}{s^2}}{-10\ \frac{m}{s^2}} = 122,5\ m$

$(s_{TOT} = \Delta s + s_{reaz} = 122,5 + 7 = 128,5\ m)$

$\Delta s = \frac{1}{2} a t^2 + v_i t$

$s_f - s_i = \frac{1}{2} a t^2 + v_i t$ $\quad a = \frac{\Delta v}{\Delta t}$ $\quad a = \frac{v_f - v_i}{t_f - t_i}$

$\Delta s = -\frac{1}{2} \frac{v_i^2}{a} + \frac{v_i^2}{a}$ $\quad \Delta t = -\frac{v_i}{a}$

$\Delta s = \frac{1}{2} \frac{v_i^2}{a}$