Ejercicios de M.R.U.A

(del 1 - 5 están resueltos en clase)

6)

$S_o = 120\ km = 120\,000\ m$

$a = 3\ m/s^2$

$V_f = 150\ km/h = 41{,}67\ m/s$

$V_o = ?$

$S_f = ?$

$t = 2h\ 45' = 9900\ s$

$V_f = V_o + a \cdot t$

$41{,}67 = V_o + 3 \cdot 124300)$

$V_o = -72858{,}33\ m/s$

$S_f = S_o + V_o \cdot t + \frac{1}{2} a t^2$

$S_f = 120000 + (-72858{,}33) \cdot (24300) + \frac{1}{2} \cdot 3 \cdot (24300)^2$

$S_f = -834602419\ m$

7)

$V_o = 20\ m/s$

$t = 5\ s$

$V_f = 25\ m/s$

$a = ?$

$V_f = V_o + a \cdot t$

$25 = 20 + a \cdot 5$

$5 = 5a$

$a = 1\ m/s^2$

8)

$t = 10\ (s)$

$V_o = 0\ (m/s)$

$V_f = 25 (m/s)$

$a = ?$

$S_f = ?$

$S_o = 0\ m$

$V_f = V_o + a \cdot t$

$25 = 0 + a \cdot 10$

$a = 2{,}5\ m/s^2$

$S_f = S_o + V_o \cdot t + \frac{1}{2} a t^2$

$S_f = 0 + 0 \cdot 10 + 1/2 \cdot 2{,}5 \cdot 10^2$

$S_f = 0 + 0 + 125 = 125\ m$

9)

$V_o = 30\ m/s$

$V_f = 20\ m/s$

$t = 5\ s$

$S_f = ?$

$a = ?$

$V_f = V_o + a \cdot t$

$20 = 30 + a \cdot 5$

$-10 = 5 \cdot a$

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

$S_f = S_o + V_o \cdot t + \frac{1}{2} a t^2$

$S_f = 0 + 30 \cdot 5 + \frac{1}{2} \cdot (-2) \cdot 5^2$

$S_f = 150 - 25$

$S_f = 125\ m$

10)

$V_f = 144\ Km/h = 40\ m/s$

$S_o = 0\ m$

$V_o = 0\ m/s$

$S_f = 1000\ m$

$V_f = V_o + a \cdot t$

* $40 = 0 + a \cdot t$ (1° ecuación)

$S_f = S_o + V_o \cdot t + \frac{1}{2} a t^2$

$1000 = 0 + 0 \cdot t + \frac{1}{2} a \cdot t^2$

* $1000 = 0'5 \cdot a \cdot t^2$ (2° ecuación)

Hay que resolver el sistema de ecuaciones

b) $\left.\begin{array}{l} 40 = a \cdot t \\ 1000 = 0'5 \cdot a \cdot t^2 \end{array}\right\}$ $a = \frac{40}{t}$

$1000 = 0'5 \cdot \left(\frac{40}{t}\right) \cdot t^2$

$1000 = 20 \cdot t$

$t = 50\ s$

a) Luego $a = \frac{40}{50} = 0'8\ m/s^2$

c) $t = 49\ s$

$S_f = S_o + V_o \cdot t + \frac{1}{2} a t^2$

$S_f = 0 + 0 \cdot 49 + \frac{1}{2} \cdot 0'8 \cdot (49)^2$

$S_f = \frac{1}{2} 0'8 \cdot (49)^2 = 960'4\ m$ distancia recorrida en 49 segundos

$1000 - 960'4 = 39'6\ m$

↳ distancia recorrida en el segundo 50.

11)

Coche → m.r.u

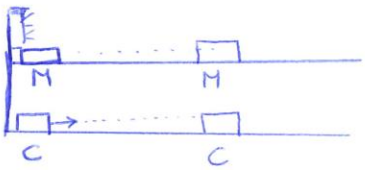
$V = 25\ m/s$

Moto → m.r.u.a

$V_o = 0\ m/s$

$V_f = ?$

$a = 4\ m/s^2$



$S_{f\,coche} = S_{f\,moto}$

$S_{f\,coche} = S_{o\,coche} + V_{coche} \cdot t$

$S_{fc} = 0 + 25 \cdot t$ x1° ecuación