/ /

MRU Exemplos:

Ex1) $x = 5 + 10t$

a) $x_0 = ?$ 5m

b) $v = ?$ $v = 10\ m/s$

c) $x = ?$ — $t = 5s$ $\Rightarrow$ $x = 5 + 10(5)$

$x = 5 + 50$

$x = 55\ m$

d) $t = ?$ $\rightarrow$ $x = 125\ m$

$125 = 5 + 10t$

$125 - 5 = 10t$

$120 = 10t$

$\frac{120}{10} = t = 12s$

Ex: 2) A ← 400 → B ⊕

$\rightarrow v_A = 6\ cm/s$ $v_B = 4\ cm/s$

a) $t = ?$ $x_A = x_B$ $x_A = 0 + 0{,}06t$ $x_B = 400 - 0{,}04t$

$0{,}06t = 400 - 0{,}04t$

$0{,}06t + 0{,}04t = 400$

$0{,}1t = 400$

$t = \frac{400}{0{,}1}$

$t = 4000s$

b) $x_A = x_B = 0{,}06 \cdot 4000$

$x_A = x_B = 240\ m$

3) $V_A = 10\ m/s$ → A

$V_B = 15\ m/s$ ← B

$X_B - X_A = 120m$

$X_A = 0 + 10t$

$X_B = 0 + 15t$

$X_B - X_A = 120 \Rightarrow 15t - 10t = 120$

$5t = 120$

$t = \frac{120}{5}$

$t = 24s$

4) a) $\Delta X_1 = 20 \times 5 = 100\ m$

$\Delta X_2 = 3 \times -15 = -45\ m$

$\Delta X_3 = 15 \times 6 = 90\ m$

$145\ m$

b) $100 + 45 + 90 = 235m$

c) $V_m = \frac{145}{14} = 10,4\ m/s$

EXERCÍCIOS:

1) $X = 30 + 10t$

a) $X_0 = 30m$

b) $V = 10\ m/s$ (progressiva)

2) $X = -5 + 20t$

$X_0 = -5m$

$V = 1\ t = 5s\ V = 20\ m/s$

$X = -5 + 20.5$

$X = -5 + 100$

$X = +95m$

$X = -5 + 20.0$

$X = -5\ m$

$X = -5 + 20.10$

$X = -5 + 200$

$X = 195m$

$\Delta X = 195\ m$

$195 - (-5) = 200\ m$

$0 = -5 + 20t$

$5 = 20t$

$t = \frac{5}{20}$

$t = 0,25s$

3. $X_0 = -5m$ $\quad$ $\boxed{X = -5 + 5t}$

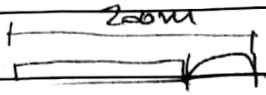
$\Delta t = 10s$ $\quad$ $v = \frac{50}{10} = 5\frac{m}{s}$

$\Delta x = 50m$

4. $l_T = 120m$

$l_p = 80m$

$v = 72\frac{km}{h} \div 3,6 = 20\frac{m}{s}$



$200 = 20t$

$\frac{20}{20} t = 10s$

5) $\Delta x = 0,8m$

$\Delta t = 3,0s \longrightarrow 1,6m$

$\Delta x_T = 160m$

a) $\frac{160}{0,8} = 200$ passos

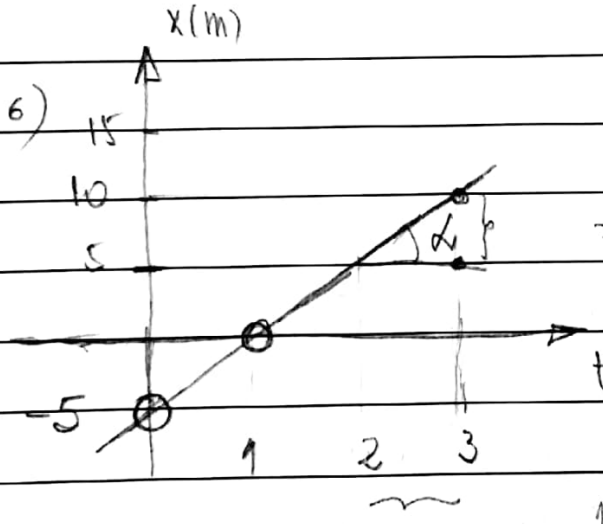
b) 2 passos $\longrightarrow$ 3s

200 passos $\longrightarrow$ x s

$t = 300s$

c) $v = \frac{160m}{300s}$ $\quad$ $\boxed{0,53\ m/s}$

6)



$\tan\alpha = v = \frac{5m}{s}$

$x = x_0 + vt$

$x = -5 + 5t$

$0 = -5 + 5t$

$5 = 5t$

$\frac{5}{5} = t = 1s$

$\frac{10-5}{3-2} = \frac{5}{1} = 5\frac{m}{s}$

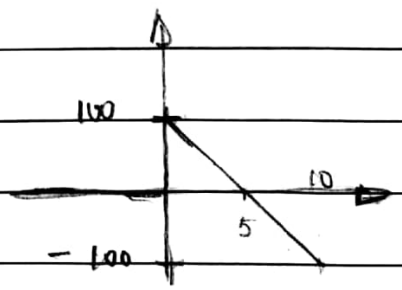
7)

a) $x = 100 - 20t$

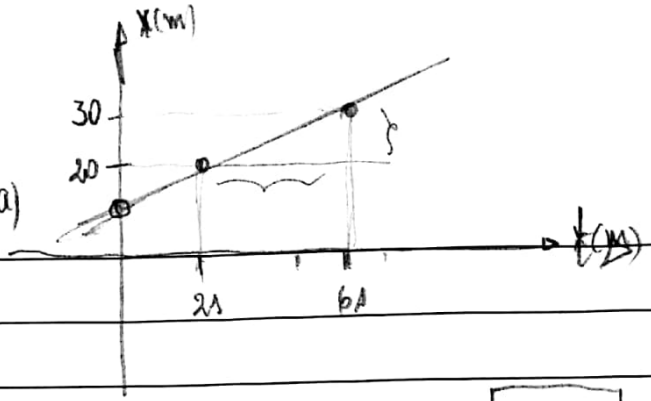
b) $0 = 100 - 20t$

$20t = 100$

$t = \frac{100}{20} = 5s$



8) a)



b) $V_m = \frac{\Delta X}{\Delta t} = \frac{30-20}{6-2} = \frac{10}{4} = \boxed{2,5\,m/s}$

$X = X_0 + VT$

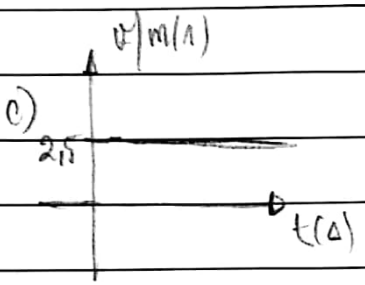
$X = X_0 + 2,5T$

$20 = X_0 + 2,5.2$

$20 = X_0 + 5$

$20 - 5 = X_0 = \boxed{15\,m}$

c)



M.R.U.V.

EXEMPLOS:

1) $a = 6\,cm/s^2$

$V_0 = 4\,cm/s$

$X_0 = 20\,cm$

a) $X = 0,20 + 0,04t + \frac{0,06t^2}{2}$

$\boxed{X = 0,20 + 0,04 + 0,03t^2}$

2) $S = t^2 + 4t + 10$

a) $V = 4\,\frac{cm}{s}$

b) $a_m = 2\,\frac{cm}{s^2}$

c) $5^2 + 4.5 + 10 = S$

$S = 25 + 20 + 10$

$S = 55\,cm$

d) $20 = t^2 + 4t + 10$

$20 - 10 = t^2 + 4t$

$30 = t^2 + 4t$

$t^2 + 4t - 30 = 0$

$t = \frac{-4 \pm \sqrt{4^2 - 2.1.(-30)}}{2a}$

$t = \frac{-4 \sqrt{16 + 60}}{2}$