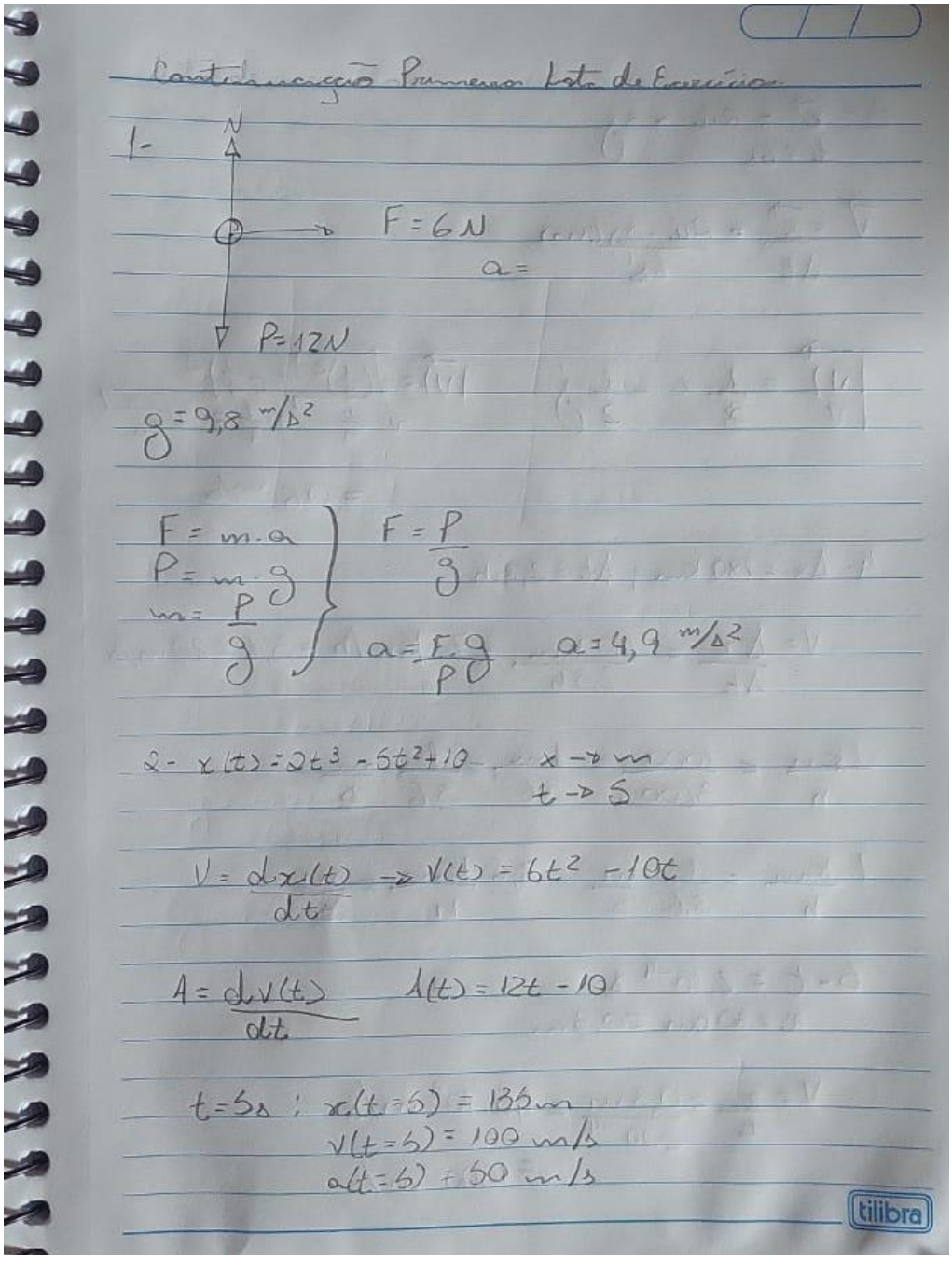
LISTA FISICA



Continuação Primeira Lista de Exercícios

1-

$a =$

$g = 9{,}8\ m/s^2$

$F = m \cdot a$

$P = m \cdot g$

$m = \frac{P}{g}$

$F = \frac{P}{g}$

$a = \frac{F \cdot g}{P}$ $\quad a = 4{,}9\ m/s^2$

2- $x(t) = 2t^3 - 5t^2 + 10$ $\quad x \to m$, $t \to s$

$V = \frac{dx(t)}{dt} \Rightarrow V(t) = 6t^2 - 10t$

$A = \frac{d.V(t)}{dt}$ $\quad A(t) = 12t - 10$

$t = 5s$; $x(t=5) = 135\ m$

$V(t=5) = 100\ m/s$

$a(t=5) = 50\ m/s$

tilibra

3 - $\vec{x} = 2\hat{i} - 3\hat{j}$
$t = 6s$

$\vec{v} = \frac{\vec{x}}{\Delta t} = \frac{2\hat{i} - 3\hat{j}\,(m)}{6s}$

$\vec{v} = \frac{1}{3}\hat{i} - \frac{1}{2}\hat{j}$ $\quad |\vec{v}| = \sqrt{\left(\frac{1}{3}\right)^2 + \left(-\frac{1}{2}\right)^2}$

$\sqrt{\frac{1}{9} + \frac{1}{4}} = \sqrt{\frac{13}{36}}$

$= 0,6\ m/s$

4 - $\Delta x = 180\ Km$; $\Delta t = 2,5\ h$

$V = \frac{\Delta x}{\Delta t} = \frac{180\ Km}{2,5\ h} = 72\ Km/h \div 3,6 = 20\ m/s$

$\frac{1\ km}{h} = \frac{1000}{3600s} = \frac{1}{3,6} = \frac{1\ m}{3,6\ s}$

$\frac{1\ Km}{h} = \frac{1}{3,6}\frac{m}{s}$ $\quad 3,6\frac{Km}{h} = \frac{m}{s}$

5 - $t = 2.10^{-4}\ s$
$x = 30\ cm = 0,3\ m$

$V = \frac{x}{t} = \frac{0,3\ m}{2.10^{-4}} = 1,5.10^3\ m/s$

$= 1500\ m/s$

6 - $\Delta V = 32\ m/s$; $\Delta t = 8\ s$

a) $a_m = \frac{\Delta V}{\Delta t} = \frac{32\ m/s}{8\ s} = 4\ m/s^2$

b) $x = x_0 + V_0 . t + \frac{1}{2} a t^2$

$x = \frac{1}{2} a t^2 = \frac{1}{2} . 4,8 = 2.64 = 128\ m$

7 - $\left.\begin{array}{l} \Delta x = 800\ m \\ \Delta t = 100\ s \end{array}\right\}$ $V = \frac{\Delta x}{\Delta t} = \frac{800\ m}{100\ s} = 8\ m/s \times 3$

$V = 28,8\ Km/h$

Aula 14/03/2022 - Primeira lista de exercícios

9 - $\vec{F_R} = m \cdot \vec{a}$

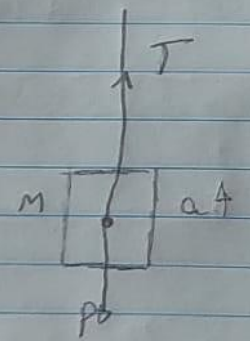
$\vec{F_1}$ $m = 4{,}65\,g$ $\vec{F_2} \rightarrow \vec{a} = ?$

$F_2 - F_1 = m \cdot a$

$a = \frac{F_2 - F_1}{m} = \frac{(120{,}82\,N - 21{,}34\,N)}{4{,}65 \cdot 10^{-3}\,kg}$

$a = 2{,}14 \cdot 10^4\ m/s^2$

10 -



$T - P = m \cdot a$

$T = M \cdot a + P$

$T = M \cdot a + M \cdot g$

$T = M \cdot (a + g)$

$T = 6525{,}32\,kg\,(2{,}24 + 9{,}81)\,\frac{m}{s^2}$

$T = 7{,}86 \cdot 10^4\,N$