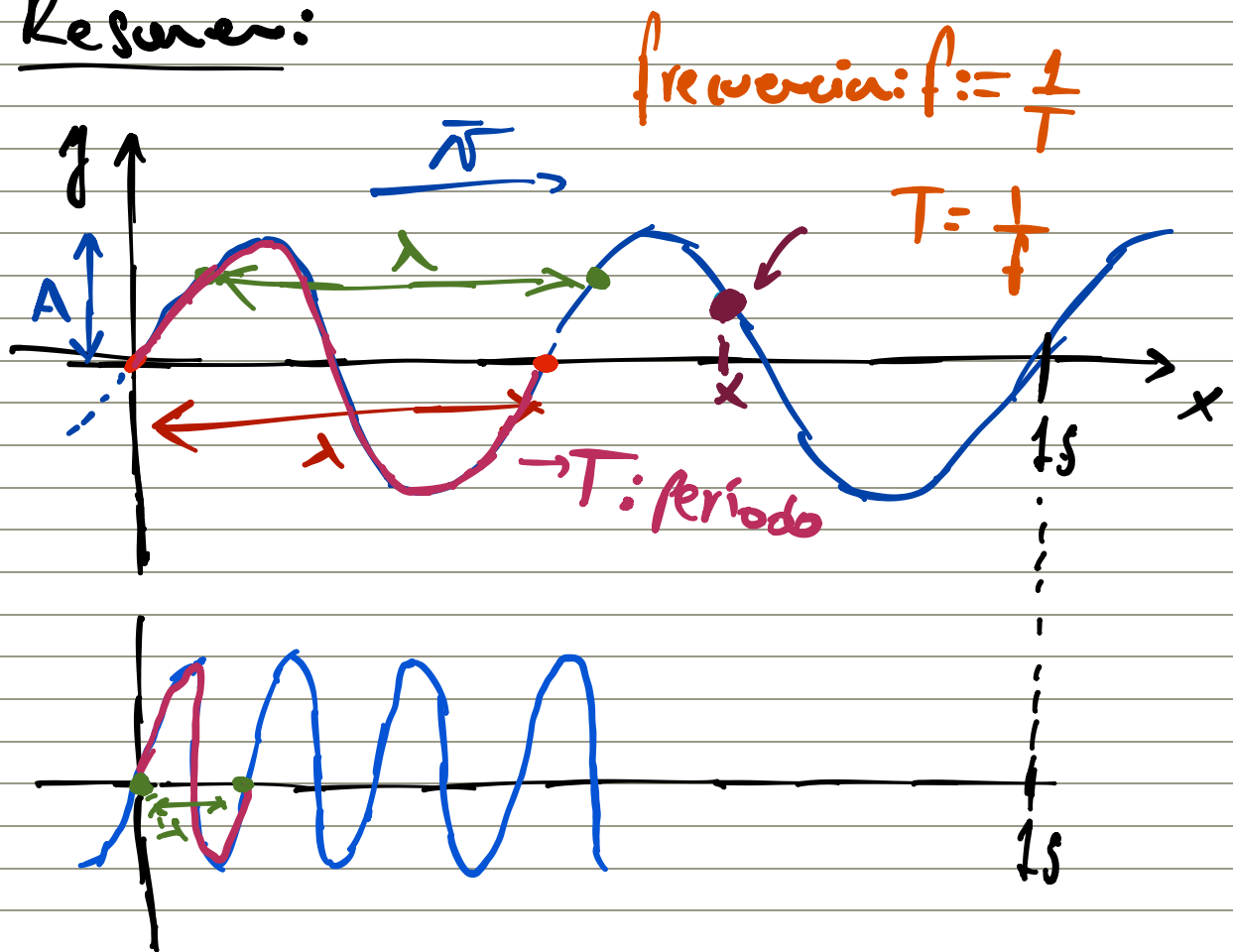


Resumen:



Número de onda (k): $k = \frac{2\pi}{\lambda}$

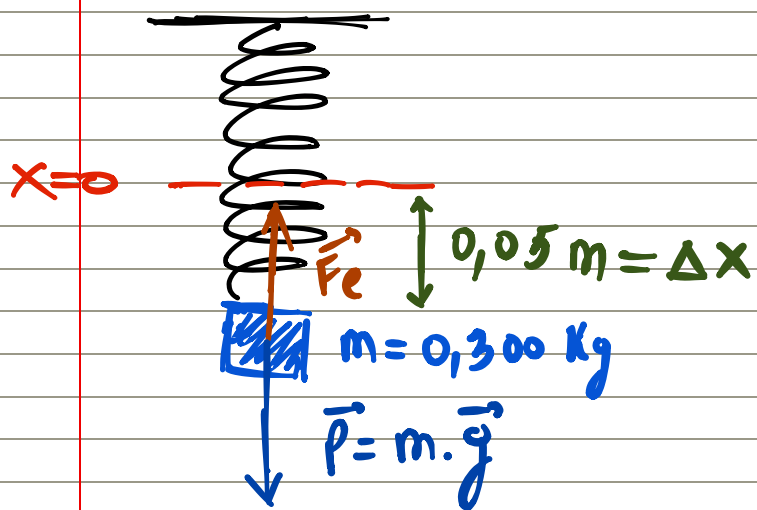
Frecuencia Angular: $\omega = 2\pi f$

$$\boxed{k = m\omega^2} \longrightarrow \boxed{\omega = \frac{2\pi}{T}}$$
$$\longrightarrow \boxed{T = 2\pi \sqrt{\frac{m}{k}}}$$

Función de Onda:

$$y(x; t) = A \cdot \text{Sen}(\omega t - kx + \phi)$$

Ejercicio 1 (P4):



Ley de Hooke

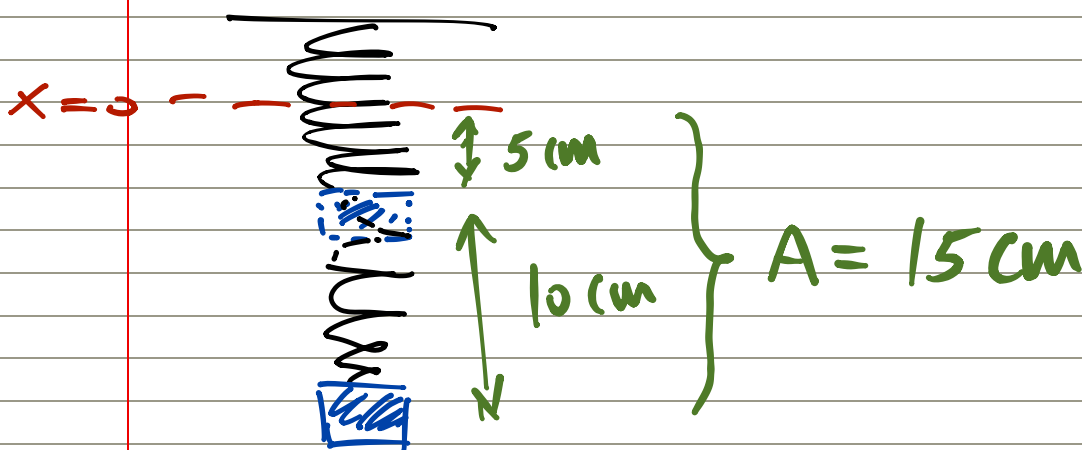
$$\vec{F}_e = -k \cdot \vec{\Delta x}$$

$$|\vec{F}_e| = k |\Delta x|$$

$$\sum F_y = 0 \Rightarrow |F_e| - |\bar{P}| = 0 \Rightarrow |F_e| = |\bar{P}|$$
$$k \Delta x = mg$$

$$\Rightarrow \boxed{k = \frac{mg}{\Delta x} = 58,8 \text{ N/m}}$$

parte b:



$$\Rightarrow T = 2\pi \sqrt{\frac{m}{k}} = 0,449 \text{ s}$$

parte c $x(t) = A \cdot \cos(\omega t + \phi)$

$$A = \text{Amplitud} = 15 \text{ cm} = 0,15 \text{ m}$$

$$\omega = \frac{2\pi}{T} = 13,9 \text{ rad/s}$$

$$x(0) = A \longrightarrow x(0) = A \cos(\omega \cdot 0 + \phi) \\ = A \cdot \cos(\phi) = A$$

$$\Updownarrow \\ \phi = 0$$

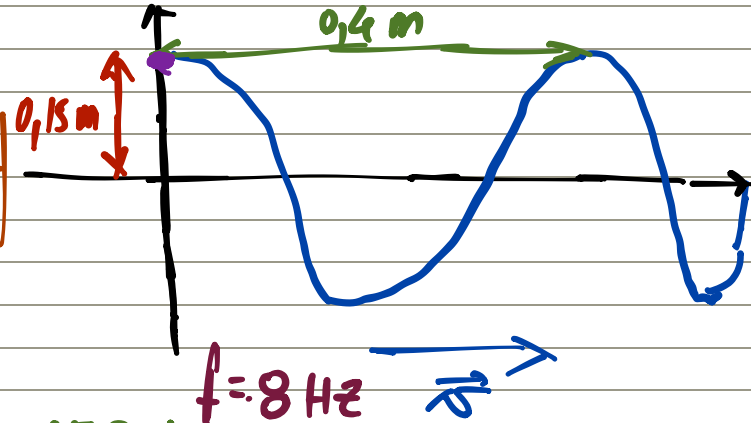
$$\Rightarrow \boxed{x(t) = 0,15 \cdot \cos(13,9 t)}$$

Ejercicio 9.2.6:

$$y(x=0; t=0) = 0,15 \text{ m}$$

$k; T; \omega; v$?

$$\rightarrow k = \frac{2\pi}{\lambda} = \frac{2\pi}{0,4} = \underline{15,7 \text{ } \frac{1}{\text{m}}}$$



$$\rightarrow T = \frac{1}{f} = \frac{1}{8} = 0,125 \text{ s}$$

$$\rightarrow \omega = \frac{2\pi}{T} = \frac{2\pi}{0,125} = \underline{50,3 \text{ } \frac{\text{rad}}{\text{s}}}$$

$$\rightarrow \boxed{v = \lambda \cdot f} \rightsquigarrow \boxed{v = \frac{\lambda}{T}}$$

$$= 0,4 \cdot 8,0 = 3,2 \text{ m/s}$$

parte b: $\phi; y(x; t)$?

$$\Rightarrow \boxed{y(x; t) = A \cdot \sin(kx - \omega t + \phi)}$$

$$y(x=0; t=0) = A \quad \leftarrow$$

$$y(x=0; t=0) = A \cdot \sin(\kappa \cdot 0 - \omega \cdot 0 + \phi)$$

$$= A \cdot \sin(\phi) = A$$

\uparrow
 Impongo

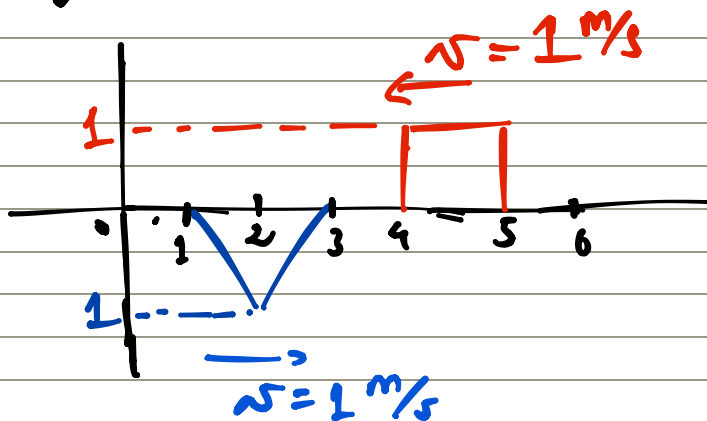
$\left. \begin{array}{l} \sin(\phi) \\ 1 \end{array} \right\}$

$$\Leftrightarrow \phi = \frac{\pi}{2}$$

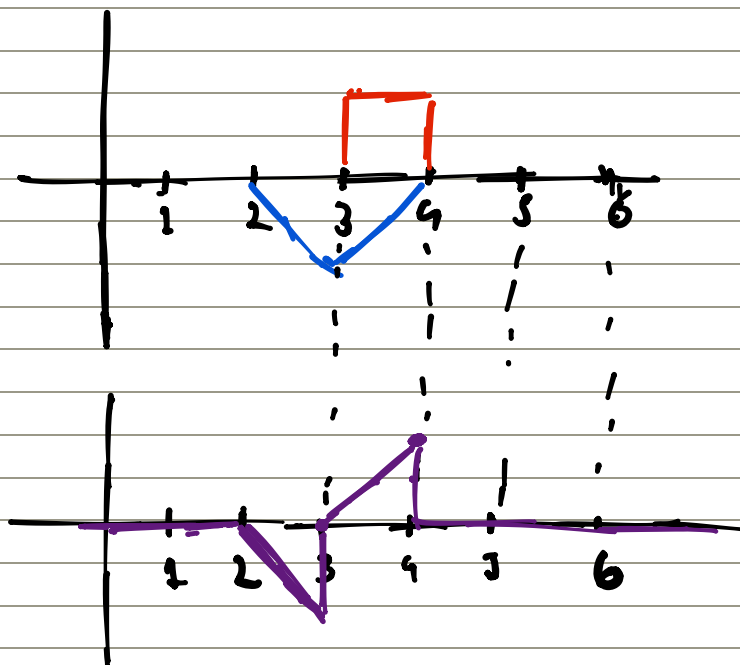
$$\sin\left(\frac{\pi}{2}\right) = 1 \text{ Radiantes}$$

$$y(x; t) = 0,15 \cdot \sin\left(15,7 \cdot x - 50,3 t + \frac{\pi}{2}\right)$$

Ejercicio 4.1.8:



Después de 1s:



Después de 1s.

