

# ONDAS

VIA SERRAS

HOJA Nº 349

FECHA

1) PÁG. 60

$$Y = 10^{-2} \text{ Sen } [2\pi (2x \frac{1}{m} - 100t \frac{1}{s})] \text{ (m, s)} \quad A=?; \lambda=?; f=?$$

$$A = 10^{-2} \text{ o } 0,01 \text{ m}$$

$$Y = 10^{-2} \text{ Sen } (4\pi x - 200\pi t) \text{ [m, s]}$$

$$k = \frac{\omega}{v} \Rightarrow v = \frac{\omega}{k}$$

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$$v = 50 \text{ m/s}$$

$$\lambda = v \cdot T \Rightarrow \lambda = 50 \text{ m/s} \cdot 0,01 \text{ s} \Rightarrow \lambda = 0,5 \text{ m}$$

$$T = \frac{2\pi}{\omega} \Rightarrow T = 0,01 \text{ s}$$

$$f = \frac{1}{T} \Rightarrow f = \frac{1}{0,01 \text{ s}} \Rightarrow f = 100 \text{ Hz}$$

2) PÁG. 60

$$Y = 2 \cdot 10^{-3} \text{ mm Sen } (2 \frac{1}{m} x - 628 \frac{1}{s} t) \quad A=?; f=?; v=?$$

$$A = 0,002 \text{ o } 2 \cdot 10^{-3} \text{ mm}$$

$$T = \frac{2\pi}{\omega} \Rightarrow T = \frac{2\pi}{628 \frac{1}{s}} \Rightarrow T = 0,01$$

$$f = \frac{1}{T} \Rightarrow f = 100 \text{ Hz}$$

$$k = \frac{\omega}{v} \Rightarrow v = \frac{\omega}{k} \Rightarrow v = 314 \text{ m/s}$$

$$3) Y = 10^{-3} \text{ cm Sen } (3 \frac{1}{m} x - 932 \frac{1}{s} t) \quad v_p=?; v_t=? (x=4, t=\frac{T}{2})$$

a)

$$k = \frac{\omega}{v} \Rightarrow v = \frac{\omega}{k} \Rightarrow v = \frac{932 \frac{1}{s}}{3} \Rightarrow v = 310,66 \text{ m/s}$$

$$v_y = A \omega \cos(kx - \omega t)$$

$$b) t = \frac{T}{2} \Rightarrow t = \frac{2\pi}{\omega} \cdot \frac{1}{2} \Rightarrow t = \frac{\pi}{\omega}$$

$$v_y = 0,001 \text{ mm} \cdot 932 \frac{1}{s} \cdot \cos(3 \frac{1}{m} \cdot 4 \text{ m} - 932 \frac{1}{s} \cdot \frac{\pi}{932 \frac{1}{s}}) \Rightarrow v_y = 0,932 \text{ mm/s} \cdot \cos(\pi)$$

$$v_y = 0,932 \text{ mm/s} \cdot \cos(507,54) \Rightarrow v_y = 0,932 \text{ mm/s} \cdot (-0,84)$$

$$\Rightarrow v_y = 0,782 \text{ mm/s}$$



[4] PÁG. 60

$$Y = 6 \text{ Sen}(0,02\pi x + 4,0\pi t) [\text{cm}, \text{s}] \quad A=?; \lambda=?; V_p=?; V_t=?$$

$$A = 6 \text{ mm}$$

$$K = \frac{\omega}{V} \Rightarrow V = \frac{\omega}{K} \Rightarrow V_p = 200 \text{ cm/s}$$

HACIA LA DERECHA

$$\lambda = VT$$

$$\lambda = 200 \text{ cm/s} \cdot 0,5 \text{ s}$$

$$\lambda = 100 \text{ cm}$$

$$T = \frac{2\pi}{\omega} \Rightarrow T = \frac{2\pi}{4\pi} \Rightarrow T = \frac{1}{2} = 0,5 \text{ s}$$

$$V_y = A\omega \text{ Cos}(kx + \omega t) \Rightarrow V_y = A\omega \Rightarrow V_y = 6 \text{ cm} \cdot 4\pi$$

$$V_y = 75,3 \text{ cm/s}$$

$$[5] Y = 2,3 \times 10^{-3} \cdot \text{Sen}(18,2x - 588t) [\text{m}, \text{s}] \quad A=?; f=?; V_p=?; V_t=?$$

$$A = 2,3 \times 10^{-3} \text{ m} = 0,0023 \text{ m}$$

$$f = \frac{1}{T} \Rightarrow f = \frac{\omega}{2\pi} \Rightarrow f = 93,5 \text{ Hz}$$

$$K = \frac{\omega}{V} \Rightarrow V = \frac{\omega}{K} \Rightarrow V = \frac{588}{18,2} \Rightarrow V_p = 32,30 \text{ m/s}$$

$$V_y = A\omega \text{ Cos}(kx - \omega t) \Rightarrow V_y = 2,3 \times 10^{-3} \text{ m} \cdot 588 \frac{1}{\text{s}} \Rightarrow V_y = 1,35 \text{ m/s}$$

