EJERCICIO F2BE2441:

$$V = \frac{s}{t} \Rightarrow V = \frac{5}{2} = 2{,}5 \text{ m/s}$$

$$\lambda = 1\text{ m} \Rightarrow V = \frac{1}{T} \Rightarrow T = \frac{1}{v} = \frac{1}{2{,}5} = 0{,}4\text{ s}$$

$$A = 0{,}6\text{ m}$$

a) $y(x,t) = A \cdot \operatorname{sen}(\omega t - kx + \varphi_0)$

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

$$k = \frac{2\pi}{\lambda} = \frac{2\pi}{1} = 2\pi \text{ rad/m}$$

$$y(x,t) = 0{,}6 \cdot \operatorname{sen}(5\pi t - 2\pi x + \varphi_0)$$

$y = 0{,}6$; en $t = 2\text{ s}$ y $x = 5\text{ m}$

$$0{,}6 = 0{,}6 \operatorname{sen}(10\pi - 10\pi + \varphi_0)$$

$$1 = \operatorname{sen}\varphi_0 \Rightarrow \varphi_0 = \frac{\pi}{2} \text{ rad.}$$

$$\boxed{y(x,t) = 0{,}6 \cdot \operatorname{sen}\left(5\pi t - 2\pi x + \frac{\pi}{2}\right)}$$

b) $v(x,t) = \dfrac{dy(x,t)}{dt}$

$$v(x,t) = 0{,}6 \cdot 5\pi \cdot \underbrace{\cos\left(5\pi t - 2\pi x + \frac{\pi}{2}\right)}_{\text{Si Vmáx igual a 1}}$$

$$\boxed{V_{máx} = 0{,}6 \cdot 5\pi = 3\pi \text{ m/s}}$$