

- Exercice 5 -

1. $\lambda_0 = 5 \text{ m}$

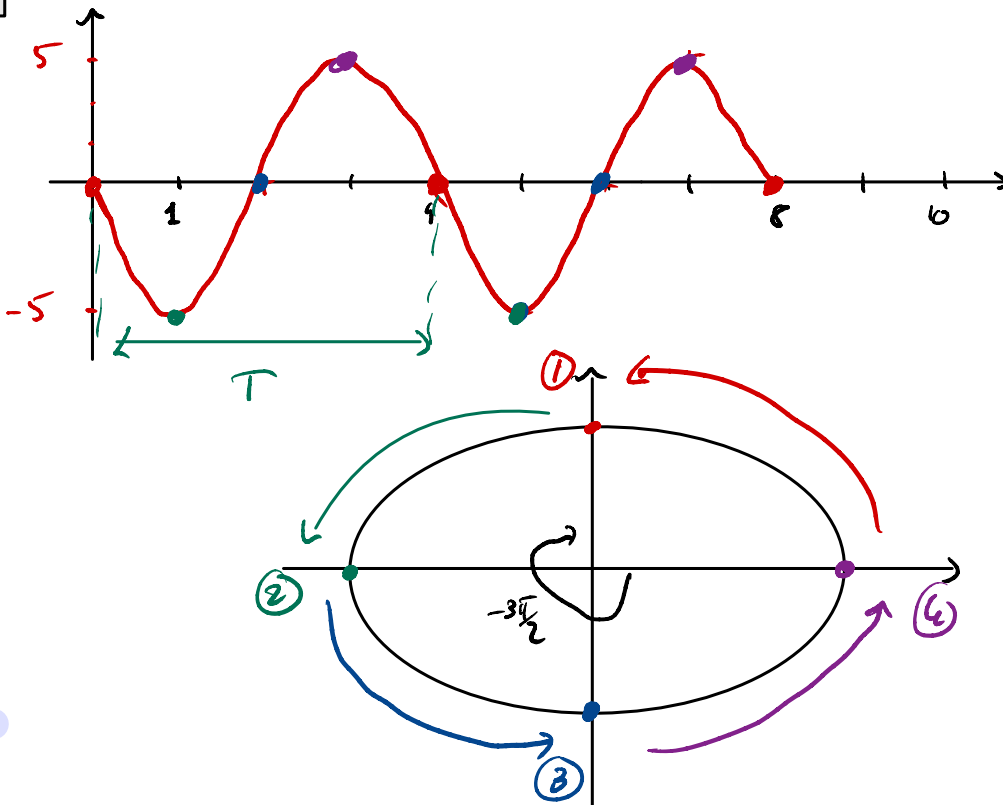
$\omega = \pi/2 \text{ rad.s}^{-1}$

$2\pi f = \omega \Leftrightarrow \frac{2\pi}{T} = \omega \Leftrightarrow T = \frac{2\pi}{\omega}$

d'où $T = \frac{2\pi}{\pi} = 4 \text{ s}$

$2\pi f = \omega \Leftrightarrow f = \frac{\omega}{2\pi} = \frac{\pi/2}{2\pi} = \frac{1}{4} = 0,25 \text{ Hz}$

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$\theta = -\pi = \frac{\pi}{2}t - \frac{3\pi}{2}$

d'où $\frac{3\pi}{2} - \pi t = \frac{\pi}{2}t \Leftrightarrow t = 1$

Les autres points se déduisent sans calculs.

3. $c = \frac{x}{t}$ A.N. $c = \frac{20}{20} = 1 \text{ m.s}^{-1}$

$c = \lambda f \Leftrightarrow \lambda = \frac{c}{f}$ I.N. $\lambda = \frac{1}{1/4} = 4 \text{ m}$

$k = \frac{2\pi}{\lambda}$ A.N. $k = \frac{2\pi}{4} = \frac{\pi}{2} \text{ rad.m}^{-1}$

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$$s(x,t) = 5 \cos\left(\frac{\pi}{2}t - \frac{\pi}{2}x - \frac{3\pi}{2}\right)$$

$$= 5 \cos\left(\frac{\pi}{2}(t-x-3)\right)$$