

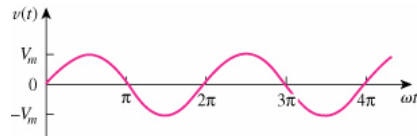
## Senoides

$$v(t) = V_m \text{sen} \omega t$$

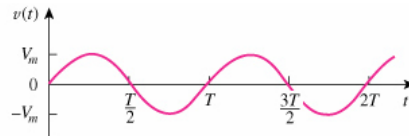
$V_m =$  Amplitud de la senoide (voltios, amperios, etc)

$\omega =$  Frecuencia angular de la senoide (rad / s)

$\omega t =$  Argumento de la senoide (rad, grados)



(a)



(b)

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

$T =$  Período (s)

$$v(t) = v(t + T)$$

Señal periódica

$$f = \frac{1}{T}$$

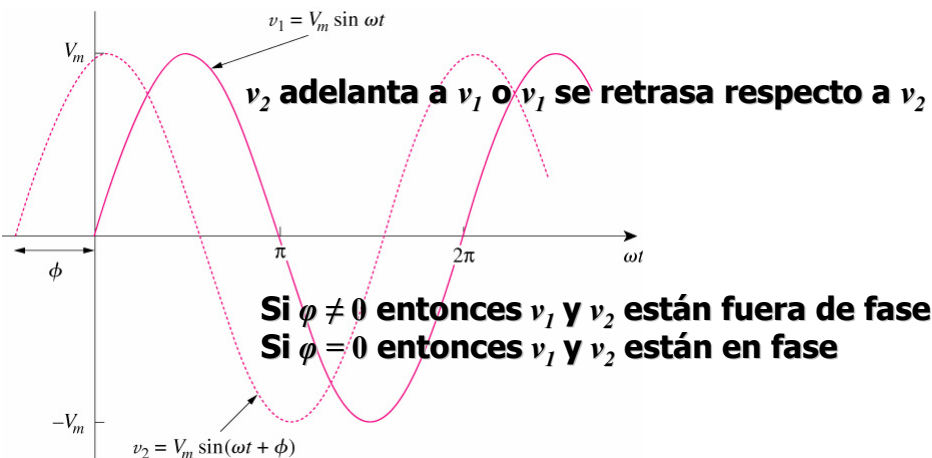
$f =$  Frecuencia (Hz)

## Expresión general

$$v(t) = V_m \text{sen}(\omega t + \phi)$$

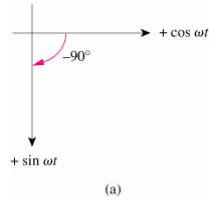
$\omega t =$  argumento,  $\phi =$  fase

## Dos funciones senoidales con fase diferente

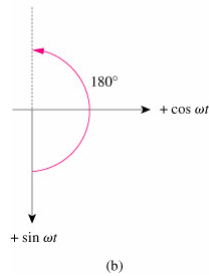


$$\text{sen}(A \pm B) = \text{sen}A\text{cos}B \pm \text{cos}A\text{sen}B$$

$$\text{cos}(A \pm B) = \text{cos}A\text{cos}B \mp \text{sen}A\text{sen}B$$



$$\text{cos}(\omega t - 90^\circ) = \text{sen}\omega t$$



$$\text{sen}(\omega t + 180^\circ) = -\text{sen}\omega t$$

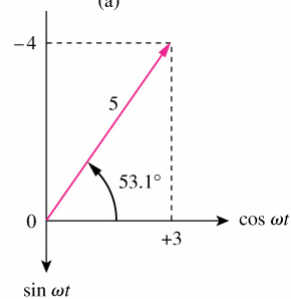
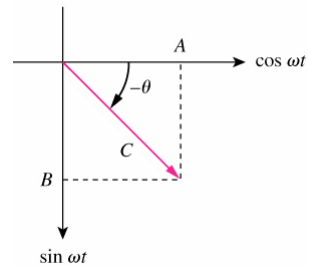
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$$A\text{cos}\omega t + B\text{sen}\omega t = C\text{cos}(\omega t - \phi)$$

$$C = \sqrt{A^2 + B^2}$$

$$\theta = \tan^{-1} \frac{B}{A}$$

$$3\text{cos}\omega t - 4\text{sen}\omega t = 5\text{cos}(\omega t + 53.1^\circ)$$



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**Determine el ángulo de fase entre:**

$$v_1 = -10\cos(\omega t + 50^\circ) \text{ y } v_2 = 12\text{sen}(\omega t - 10^\circ)$$

