

Phasors

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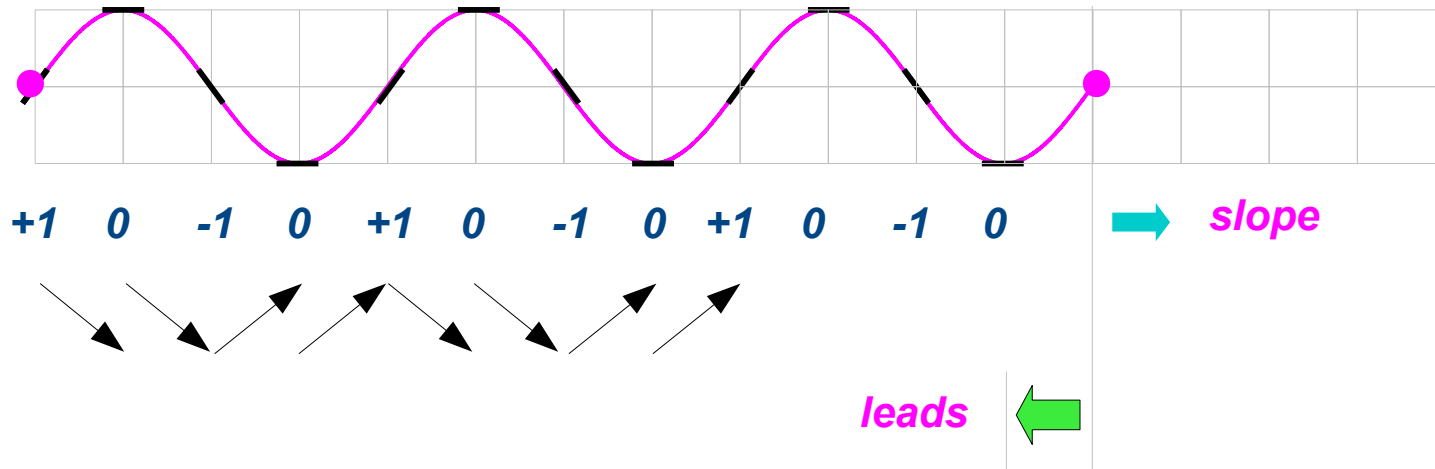
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Please send corrections (or suggestions) to youngwlim@hotmail.com.

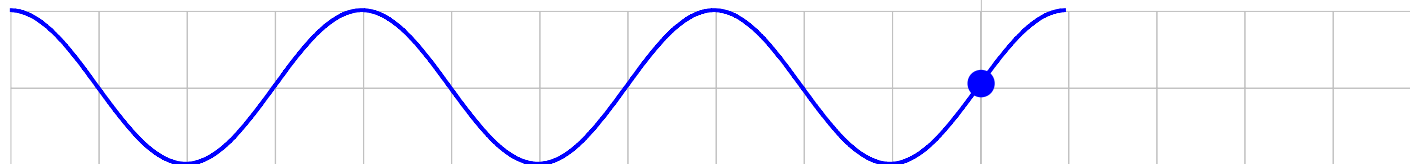
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Derivative of $\sin(x)$

$$f(x) = \sin(x)$$

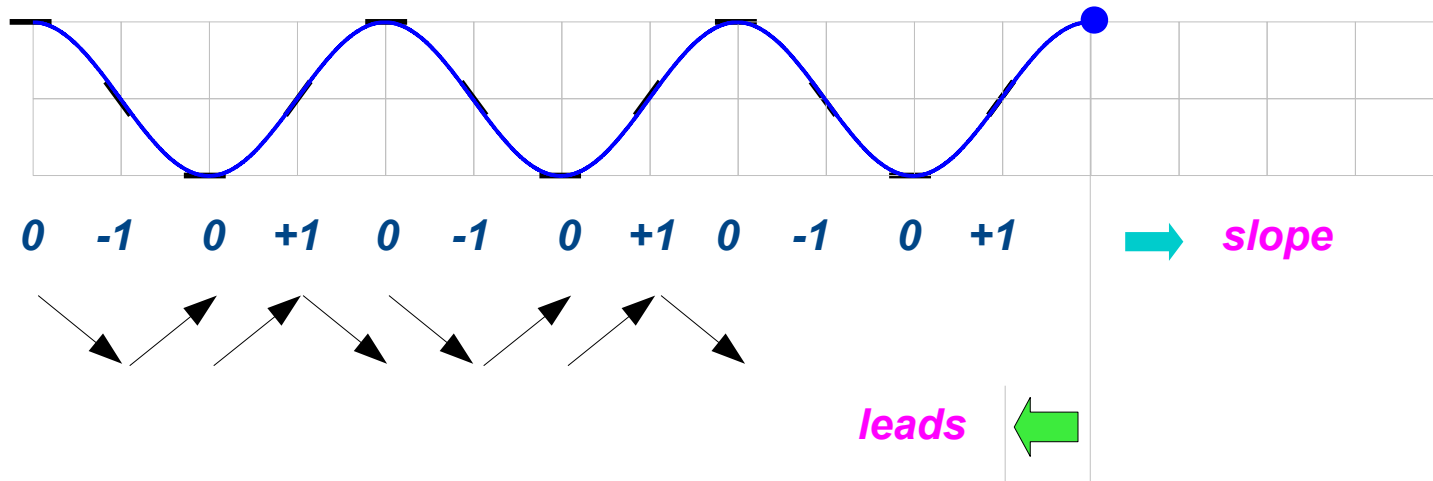


$$f'(x) = \cos(x)$$

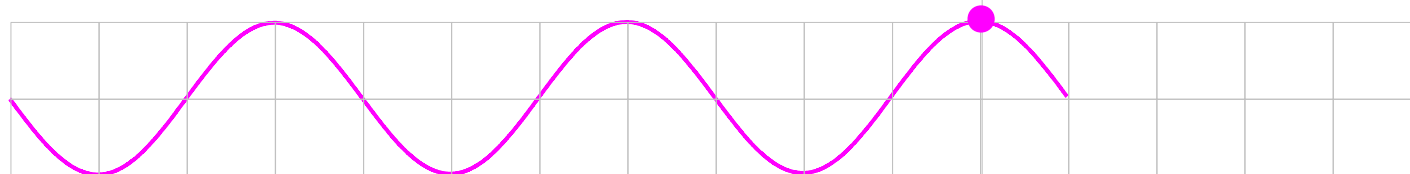


Derivative of $\cos(x)$

$$f(x) = \cos(x)$$



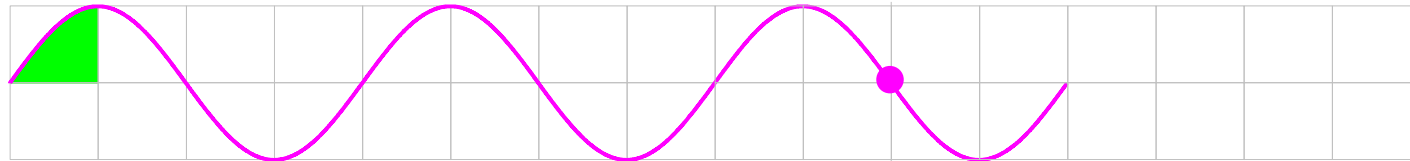
$$f'(x) = -\sin(x)$$



Integral of $\sin(x)$

$$f(x) = \sin(x)$$

$$\int_0^{\pi/2} \sin(x) dx = 1$$



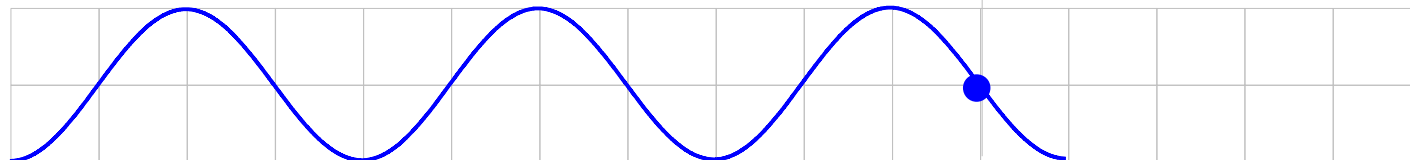
0 1 2 1 0 1 2 1 0 1 2 1 → area $C = 1$

-1 0 +1 0 -1 0 +1 0 -1 0 +1 0 → area -1 $C = 0$

→ lags

$$\int f(x) dx = -\cos(x) + C$$

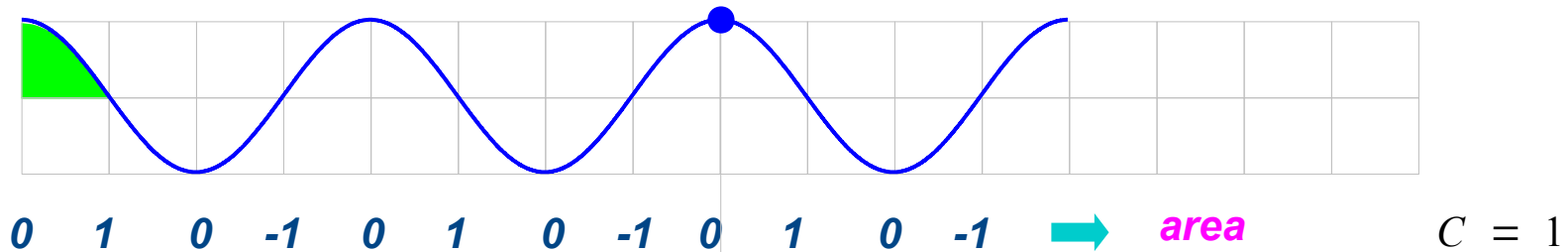
$C = 0$



Integral of $\cos(x)$

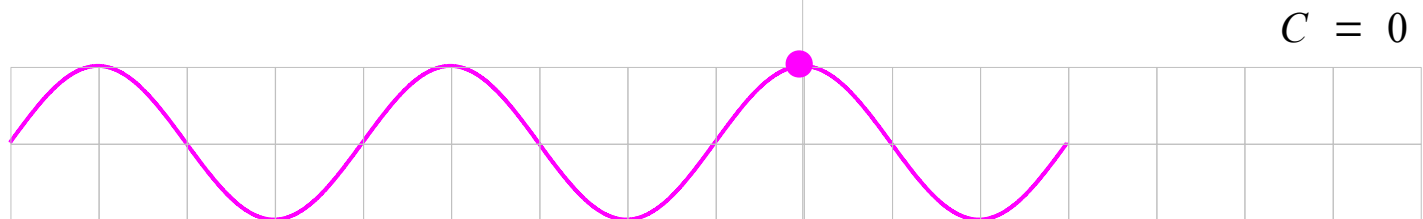
$$f(x) = \cos(x)$$

$$\int_0^{\pi/2} \cos(x) dx = 1$$



lags

$$\int f(x) dx = \sin(x) + C$$



Phasor

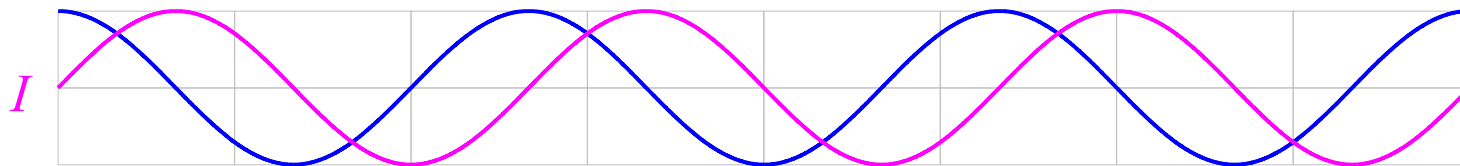
$$A \cos(\omega t + \theta)$$

$$A \cos(\omega t + \theta) = \Re \{ A e^{i(\omega t + \theta)} \}$$

$$= \Re \{ e^{i\omega t} \cdot A e^{i\theta} \}$$

$$A e^{i\theta}$$

$$A \angle \theta$$



3 cycles

Phasor

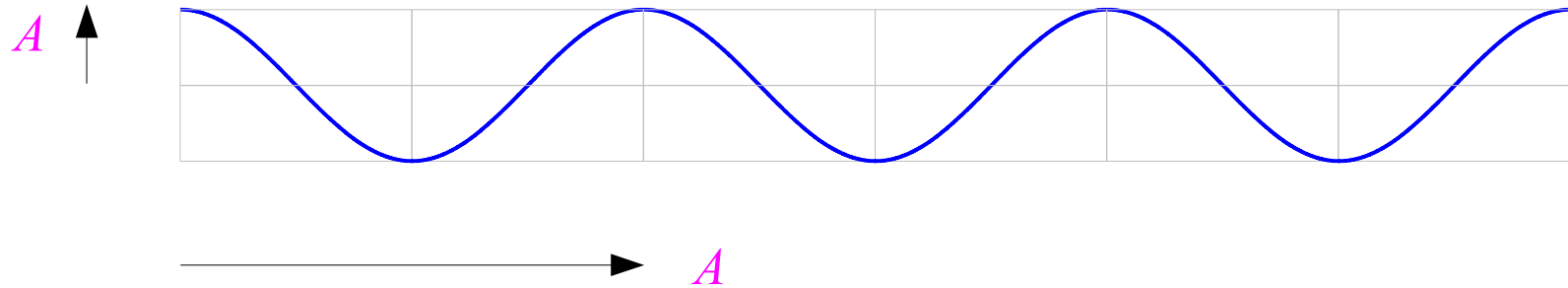
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$$A e^{i\theta}$$

$$A \angle \theta$$



References

- [1] <http://en.wikipedia.org/>
- [2] J.H. McClellan, et al., Signal Processing First, Pearson Prentice Hall, 2003