

# ChatGPT vs Bard



Complex exponential function.



D is  $e^{j\omega t} = e^{-j\omega t}$ ?



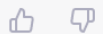
No,  $e^{j\omega t}$  and  $e^{-j\omega t}$  are complex conjugates of each other, which means they have the same magnitude but opposite signs in their imaginary parts.

Using Euler's formula, we can write:

$$e^{j\omega t} = \cos(\omega t) + j \sin(\omega t)$$

$$e^{-j\omega t} = \cos(-\omega t) + j \sin(-\omega t) = \cos(\omega t) - j \sin(\omega t)$$

We can see that the real part (cosine) of  $e^{j\omega t}$  is the same as the real part of  $e^{-j\omega t}$ , but the imaginary part (sine) of  $e^{-j\omega t}$  is the negative of the imaginary part of  $e^{j\omega t}$ . Therefore,  $e^{j\omega t}$  and  $e^{-j\omega t}$  are complex conjugates of each other.



Bard [Experiment](#)



D



is  $e^{j\omega t} = e^{-j\omega t}$ ?



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No,  $e^{j\omega t}$  and  $e^{-j\omega t}$  are not equal.

$e^{j\omega t}$  is a complex number that represents a sinusoid of frequency  $\omega$  and phase  $t$ .  $e^{-j\omega t}$  is a complex number that represents a sinusoid of frequency  $\omega$  and phase  $-t$ . The phases of the two sinusoids are opposite, so the two sinusoids are out of phase by 180 degrees.



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