A quick note on business calculus "What if sin and cos are differentiated four times ?"



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What if sin and cos are differentiated four times? → return to original form.

- e.g. Differentiating sin x four times....
- 1. (sin x)'=cos x
- 2. (cos x)'=-sin x
- 3. (-sin x)'=-cos x

1.50

1.00

0.50

0.00

-0.50

-1.00

-1.50

4. $(-\cos x)'=\sin x$ return to $\sin x$



A single differentiation advances the phase by $\pi/2$. If you differentiate 4 times, you get back to $(\pi/2)X4=2\pi$. Differentiating cos x four times return to cos x as well.

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Waveform of sin x

