Maclaurin Series

Kutay

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Outline

What is it?

- Approximation of a function with an infinite series
- Approximates near 0

Why?

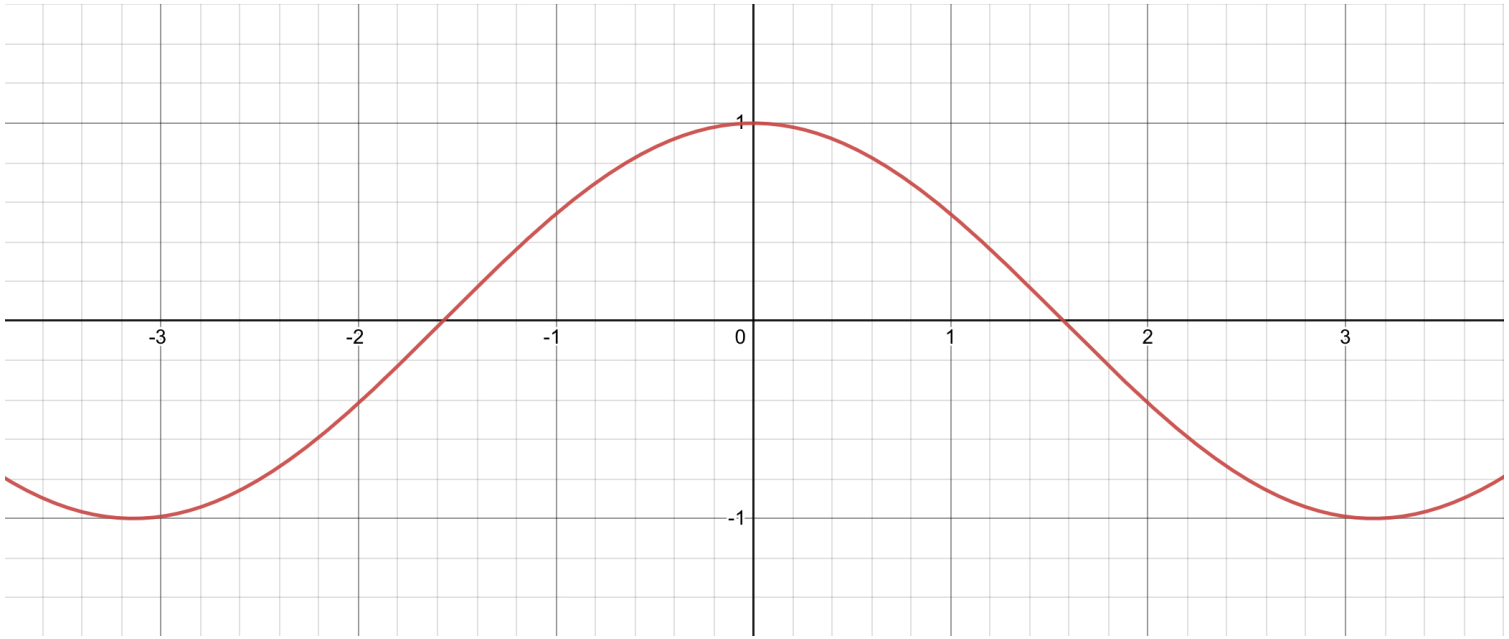
- To compute $\sin x$, $\cos x$, and e^x *fast*
- Calculators (your TI) use this technique
- To simplify equations/functions
- In simple pendulum, we *approximated* $\sin x$ with x

Derivation

- Calculators can multiply, add, subtract, divide, and take powers of whole numbers *quickly*
- Let us use *polynomials*
- Polynomials are just multiplications, additions, and exponentiations

Derivation

Figure: The Function $\cos x$



- Approximate to two degrees
- Find real numbers for a, b, and c that approximate $\cos x$ the *best*

$$\cos x \approx a + bx + cx^2$$