HW14

Shariq Mian

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f(x)= 1/(1-x) f′(x)=1(1−x)2 f′′(x)=2(1−x)3

f′′′(x)=6(1−x)4

f′′′′(x)=24(1−x)5

Evaluate at x=0 f′(0)=1 f′′(0)=2 f′′′(0)=6 f′′′′(0)=24

generalized fn(x)=n!(1−x)n+1

therefore as our coefficents are always n! ∑n=0∞fn(x)n!∗xn==∑n=0∞xn

f(x) = e^x fn(x)=ex

en(0)=1

Therefore our coefficents are always one leaving us ∑n=0∞e0n!∗xn==xnn! f(x)=ln(1+x) f′(x)=1(x+1)

f′′(x)=−1(x+1)2

f′′′(x)=2(x+1)3 f′′′′(x)=−6(x+1)4

evaluate at x=0 f′(0)=1 f′′(0)=−1 f′′′(0)=2 f′′′′(0)=−6

series looks like

0+11x1−12x2+26x3−624x4

We can see that coefficents are alternating signs and simplifies to xn/n , but starts at n=1 becuase it is undefined at n=0 ∑n=1∞=(−1)n+1xnn