is605 Assign14 TaylorSeriesExpansion

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Problem 1

Expand $f(x) = 1/(1-x)$

Answer (for $a = 0$):

$1/(1-x) = 1 + x + x^2 + x^3 + x^4 + x^5 + x^6 + x^7 + ...$

$= \sum\limits_{n=0}^{\infty} x^n$

Problem 2

Expand $f(x) = e^x$

Answer (for $a = 0$):

$e^x = 1 + x + (x^2/2) + (x^3/6) + (x^4/24) + (x^5/120) + (x^6/720) + (x^7/5040) + ...$

$= \sum\limits_{n=0}^{\infty} (x^n/n!)$

Problem 3

Expand $f(x) = ln(1+x), x \in (-1, 1]$

Answer (for $a = 0$):

$ln(1+x) = x - (x^2/2) + (x^3/3) - (x^4/4) + (x^5/5) - (x^6/6) + (x^7/7) + ...$

$= \sum\limits_{n=0}^{\infty} (-1)^{n+1}(x^n/n)$