DLN 2.4.3 cont

Recall that you were requested to differentiate the function

$$f(z) = -\frac{z}{\log(1-z)}$$

a few times to see that differentiation to get

$$f^{[n]}(0)/n!$$

is <u>not</u> the easiest way to get the Taylor series for f. I didn't bother to do any differentiating and few of you did, so for the reference I got the computer to do it, using a program called FORMAL which does algebraic manipulations and can differentiate functions <u>analytically</u>, not numerically. Mention

```
F=-X/LOG[1-X]
 F=-X/LOG[1-X]
OPTION EXPAND(8),INT,MFCT          ] Ignore
 OPTION EXPAND(8),INT,MFCT
NOPRIN
PRINT F
 F =
 - X / LOG [1 - X]          ←——— f       ←—— by the 1st derivative of f
F=DIF[F,X,1]   ← This says to replace f
PRINT F            with respect to X.
 F =
 - X / (1 - X) / LOG [1 - X] ** 2 - 1 / LOG [1 - X]   ← f'
F=DIF[F,X,1]   ← Again.
PRINT F
 F =
 - 2 / (1 - X) / LOG [1 - X] ** 2 - 2 * X / (1 - X) ** 2 / LOG [1 - X]   ← f''
 ** 3 - X / (1 - X) ** 2 / LOG [1 - X] ** 2
G=NUM[F]
H=DENOM[F]
PRINT G,H                                                         Ignore
 G =
 - 2 / (1 - X) / LOG [1 - X] ** 2 - 2 * X / (1 - X) ** 2 / LOG [1 - X]
 ** 3 - X / (1 - X) ** 2 / LOG [1 - X] ** 2
 H =
 1
```