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1. $F(x) = \frac{1}{1+x} = \frac{1}{1-(-x)} = \sum_{n=0}^{\infty} (-x)^n = \sum_{n=0}^{\infty} (-1)^n x^n$

2. $F(x) = \frac{1}{(1+x)^2} = Dx\left(\frac{1}{1-(-x)}\right) = \sum_{n=0}^{\infty} n(-x)^{n-1}$

3. $F(x) = \frac{x^2}{1+x} = x^2 \frac{1}{1-(-x)} = x^2 \cdot \sum_{n=0}^{\infty} (-x)^n x^2 = \sum_{n=0}^{\infty} (-1)^n x^{n+2}$

4. $F(x) = \frac{1}{1-(-x^2)} = \sum_{n=0}^{\infty} (-1)^n x^{2n}$

5. $F(x) = \tan^{-1}(x) = \sum_{n=0}^{\infty} \frac{x^{2n+1}}{2n+1} = x - \frac{x^3}{3} + \frac{x^5}{5} + \frac{x^7}{7} + \dots$

6. $F(x) = \ln\left(\frac{1-x}{1+x}\right) = \ln(1-x) - \ln(1+x)$
$= \left(\sum_{n=1}^{\infty} (-1)^{n+1} \frac{1}{n} (-x)^n\right) - \left(\sum_{n=1}^{\infty} (-1)^{n+1} \frac{1}{n} x^n\right)$
$= \left(\sum_{n=1}^{\infty} \frac{(x)^n}{n}\right) - \left(\sum_{n=1}^{\infty} (-1)^{n+1} \frac{x^n}{n}\right)$
$= \sum_{n=1}^{\infty} \left(\frac{(x)^n}{n} - (-1)^{n+1} \frac{x^n}{n}\right)$
$= \sum_{n=1}^{\infty} \left(\frac{x^n}{n}\left(1-(-1)^{n+1}\right)\right)$

7. $F(x) = \frac{1}{(2+5x)} = \frac{\sqrt{2}}{1+\frac{3}{2}x} = \frac{1}{2} \cdot \frac{1}{1-\left(-\frac{3}{2}x\right)} = \frac{1}{2} \sum (-1)^n \left(\frac{3}{2}x\right)^n$

8. $F(x) = e^x + e^{-x} = \sum_{n=0}^{\infty} \frac{x^n}{n!} + \sum_{n=0}^{\infty} \frac{(-1)^n x^n}{n!} = \sum_{n=0}^{\infty} \frac{x^n}{n}\left(1+(-1)^n\right)$

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9. $F(x) = e^{3x} = \sum_{n=0}^{\infty} \frac{(3x)^n}{n!}$