

(A3)

$$f(x) = (1+x)e^x - (1-x)e^x$$

$$= \sum_{n=2}^{\infty} \frac{(-1)^n}{n!} x^n + \sum_{m=2}^{\infty} \frac{1^m}{m!} (-1)^m x^m - \sum_{k=2}^{\infty} \frac{x^k}{k!} + \sum_{j=2}^{\infty} \frac{j}{j!} x^j$$

$$= \sum_{n=2}^{\infty} \frac{(-1)^n + n(-1)^{n-1} - 1 + n}{n!} x^n$$

$$= \sum_{n=2}^{\infty} \frac{2n-1-1+n}{(2n)!} x^n = \sum_{n=2}^{\infty} \frac{2}{(2n)!} x^n$$

$$= 2 \cdot \sum_{n=2}^{\infty} \frac{1}{(2n)!} x^n = 2 \cos x$$

$$\text{A) } \sum_{n=2}^{\infty} \frac{(2n)!}{(2n)!} x^n = \frac{1}{2} f(x) + \cos x \Big|_{x=1}$$

$$= \frac{1}{2} e + \cos 1$$