[レポート問題(4/14), 解答]

1. 略答
2. 略答

3. (a) $\left((ax+b)^n\right)' = an(ax+b)^{n-1}$

(b) $\left(e^{x^2}\right)' = 2x e^{x^2}$

(c) $\left(\ln(ax^3+b)\right)' = \dfrac{3ax^2}{ax^3+b}$

(d) $\left(\sin\left(\sqrt{x+1}\right)\right)' = \dfrac{1}{2\sqrt{x+1}}\cos\left(\sqrt{x+1}\right)$

4. $e^{ix} = 1 + ix + \frac{1}{2}(ix)^2 + \frac{1}{3!}(ix)^3 + \frac{1}{4!}(ix)^4 + \cdots$

$= 1 - \frac{1}{2}x^2 + \frac{1}{4!}x^4 + \cdots$

$+ i\left(x - \frac{1}{3!}x^3 + \cdots\right)$

一方 $\cos x = 1 - \frac{1}{2}x^2 + \frac{1}{4!}x^4 + \cdots$

$\sin x = x - \frac{1}{3!}x^3 + \cdots$ より明らか.