[1] $\frac{3}{2}a$

[2] $\begin{bmatrix} 2 & 1 \\ 4 & 5 \end{bmatrix}$

[3] (1) $\frac{dz}{dx} = 2xz$

(2) $y = Ce^{x^2} + x^3$ （Cは任意定数）

[4] (1) $\frac{1}{n^2}(\cos n\pi - 1) = \frac{1}{n^2}\{(-1)^n - 1\}$

(2) $f(x) = \frac{\pi}{2} - \frac{2}{\pi}\sum_{n=1}^{\infty}\frac{1}{n^2}\{(-1)^n - 1\}\cos nx$

$= \frac{\pi}{2} + \frac{4}{\pi}\left(\frac{\cos x}{1^2} + \frac{\cos 3x}{3^2} + \frac{\cos 5x}{5^2} + \cdots\right)$