

①

מ"ו"ו מ"ו"ו - 1 מ"ו"ו מ"ו"ו

1 מ"ו"ו, 2 מ"ו"ו (1) ①

1 מ"ו"ו, 3 מ"ו"ו (2)

2 מ"ו"ו, 3 מ"ו"ו (2)

$y = C \cdot (x^2 + 4)$  (1) ②

$y = -\ln\left(\frac{x^2}{2} + C\right)$  (2)

$y = 1$ ,  $\frac{y^2}{2} + y + \ln|y-1| = -\frac{1}{x} + C$  (2)

$$y' = e^{2x+3y+5}$$

③

$$z' = 2 + 3y'$$

$$\text{פ"ו} \quad z = 2x + 3y + 5 \quad \text{מ"ו"ו}$$

$$y' = \frac{z'-2}{3} \Rightarrow \frac{z'-2}{3} = e^z \Rightarrow \frac{dz}{dx} - 2 = 3e^z$$

$$\frac{dz}{dx} = 3e^z + 2 \Rightarrow \frac{dz}{3e^z + 2} = dx$$

$$\int \frac{dz}{3e^z + 2} = \int dx + C$$

$$\int \frac{dz}{3e^z + 2} = \left| \begin{array}{l} t = e^z, \quad z = \ln t \\ dz = \frac{1}{t} dt \end{array} \right| = \int \frac{dt}{t \cdot (3t + 2)}$$

$$\frac{1}{t(3t+2)} = \frac{A}{t} + \frac{B}{3t+2}$$

$$1 = A(3t+2) + Bt = (3A+B)t + 2A$$

$$t^0: 1 = 2A = \underline{A = \frac{1}{2}}$$

$$t^1: 0 = 3A + B = \underline{B = -\frac{3}{2}}$$

$$\rightarrow \int \frac{dt}{t(3t+2)} = \frac{1}{2} \int \left( \frac{1}{t} - \frac{3}{3t+2} \right) dt = \frac{1}{2} (\ln t - \ln(3t+2))$$

$$= \frac{1}{2} t - \frac{1}{2} \ln(3e^2 + 2)$$

$$z = 2x + 3y + 5 \quad \text{: ננסה } z$$

$$x = \frac{2x + 3y + 5}{2} - \frac{1}{2} \cdot \ln(3e^{2x+3y+5} + 2) + C$$

$$y = \ln \frac{e^x + 1}{2} \quad \begin{matrix} 2y^2 + 4y = (\ln x + 1)^2 - 3 \\ \text{1} \end{matrix}$$

$$\begin{cases} y' = \frac{1}{\ln(2x+y)} - 2 \\ y(0) = e \end{cases} \quad \begin{matrix} \text{2} \\ \text{3} \end{matrix}$$

$$y' = z' - 2 \quad \Leftrightarrow z' = 2 + y' \quad \Leftrightarrow z = 2x + y \quad \text{: ננסה}$$

$$z' - 2 = \frac{1}{\ln z} - 2$$

$$\frac{dz}{dx} = \frac{1}{\ln z}$$

$$\int \ln z \, dz = \int dx + C$$

$$\int \ln z \, dz = \begin{vmatrix} u = \ln z & dv = dz \\ du = \frac{1}{z} dz & v = \int dz = z \end{vmatrix}$$

$$z \cdot \ln z - z = x + C$$

$$(2x+y) \cdot (\ln(2x+y) - 1) = x + C \quad \text{: ננסה } z$$

$$y(0) = e \quad \text{: ננסה } z$$

$$(2 \cdot 0 + e) \cdot (\ln(2 \cdot 0 + e) - 1) = 0 + C$$

$$C = 0$$

$$(2x+y) (\ln(2x+y) - 1) = x$$

$$y = \sin x \quad \text{3}$$

$$C(t) = \frac{a}{b} + \tilde{C} \cdot e^{-bt} \quad \text{1} \quad \text{4}$$

$$\text{10 N } '3''N \quad \text{2}$$