$$\frac{1}{y - ay^2} = \frac{A - aAy + By}{y - ay^2}$$

$$1 = A + (-a A + B)\, y$$

$$A = 1$$

$$-a A + B = 0 \Rightarrow -a + B = 0 \Rightarrow B = a$$

$$\Rightarrow \frac{1}{y - ay^2} = \frac{1}{y} + \frac{a}{1 - ay}$$

$$\Rightarrow \int \left(\frac{1}{y} + \frac{a}{1 - ay} \right) dy = \int \frac{1}{a + x}\, dx$$

$$\Rightarrow \text{Ln } y - \text{Ln}(1 - ay) = \text{Ln}(a + x) + c$$

$$\text{Ln } \frac{y}{(1 - ay)(a + x)} = \text{Ln } e^c$$

$$\Rightarrow y = (1 - ay)(a + x)\, e^c$$

(f) $3e^x \tan y\, dx + (1 - e^x) \sec^2 y\, dy = 0$

ل :

$$3e^x \tan y\, dx = -(1 - e^x) \sec^2 y\, dy$$

$$\frac{\sec^2 y}{\tan y}\, dy = -\frac{3e^x}{1 - e^x}\, dx$$

$$\int \frac{\sec^2 y}{\tan y}\, dy = -3 \int \frac{e^x}{1 - e^x}\, dx$$

$$\text{Ln tan } y = 3 \text{Ln}(1 - e^x) + \text{Ln } c$$

$$\text{Ln tan } y = \text{Ln}(1 - e^x)^3 + \text{Ln } c$$

$$\Rightarrow \text{Ln} \frac{\tan y}{(1 - e^x)^3} = \text{Ln } c$$