

$$\textcircled{36} \frac{dy}{dt} = t e^{-y}$$

$$y(1) = 0$$

$$\frac{dy}{e^{-y}} = t dt$$

$$\int e^y dy = \int t dt$$

$$e^y = \frac{1}{2} t^2 + C$$

$$y = \ln\left(\frac{1}{2} t^2 + C\right)$$

$$0 = \ln\left(\frac{1}{2} + C\right)$$

$$y = \ln\left(\frac{1}{2} t^2 + \frac{1}{2}\right)$$

(38)  $\sqrt{1-x^2} y' = y^2 + 1 \quad y(0) = 0$

$$\int \frac{dy}{y^2+1} = \int \frac{dx}{\sqrt{1-x^2}}$$

$$\tan^{-1} y = \sin^{-1} x + C$$

$$\tan(\tan^{-1} y) = \tan(\sin^{-1} x + C)$$

$$y = \tan(\sin^{-1} x + C)$$

$$0 = \tan(\sin^{-1} 0 + C)$$

$$(34) (1-t) \frac{dy}{dt} - y = 0 \quad y(2) = -4$$

$$(1-t) \frac{dy}{dt} = y$$

$$\int \frac{dy}{y} = \int \frac{dt}{1-t} \quad u = 1-t$$

$$\begin{aligned} \ln|y| &= -\ln|1-t| + C \\ &= \ln|1-t|^{-1} + C \end{aligned}$$

$$e^{\ln|y|} = e^{\ln\left|\frac{1}{1-t}\right| + C}$$

$$|y| = e^C \cdot \left|\frac{1}{1-t}\right| = C \cdot \left|\frac{1}{1-t}\right|$$

$$-4 = C \cdot \frac{1}{1-2} \quad -4 = C \cdot (-1)$$

$$C = 4$$

$$y = \frac{4}{1-t}$$