

$$4.4) \frac{dy}{dt} + p(t)y = g(t)$$

$$\frac{d(yu) + u p(t)y}{dt} = u(t)g(t) \quad + \text{dalet } g(t) = 0$$

$$\frac{du}{dt} = p(t) \cdot u$$

4.5)

$$4.2) \frac{dy}{dt} + p(t)y = g(t)$$

$$\frac{du}{dt} = p(t) \cdot u \quad \Rightarrow \int \frac{1}{u} du = \int p(t) dt \quad \Rightarrow \ln|u| = \int p(t) dt$$

$$\ln|u(t)| = \int p(t) dt + \tilde{C} \quad \Rightarrow |u(t)| = e^{\int p(t) dt + \tilde{C}} = e^{\int p(t) dt} \cdot e^{\tilde{C}}$$

$$|u(t)| = \pm e^{\tilde{C}} \cdot \exp \int p(t) dt = u(t) = C \cdot \exp \int p(t) dt$$

$$|u(t)| = \pm e^{\tilde{C}} \cdot \exp \int p(t) dt = u(t) = C \cdot \exp \int p(t) dt$$

$$4.6) \begin{cases} Ty' + 2y = 4T^2 \\ y(1) = 2 \end{cases} \quad \Rightarrow y' = 4T - \frac{2y}{T} \quad T \neq 0$$

$$u(t) = \exp \int \frac{2}{T} dt = \exp 2 \ln(T) = T^2$$

$$T^2 y' + 2Ty = 4T^3 \quad \frac{d(T^2 \cdot y)}{dt} = 4T^3$$

$$T^2 y = 4T^4 \quad \Rightarrow y = T^2 + \tilde{C} // = C = 1 //$$

[Signature]