$$u(t) = 1 + \frac{1}{a}\int_0^t u(\tau)\left(\sin t\cos\tau - \cos t\sin\tau\right)d\tau$$

$$= 1 + \frac{1}{a}\left\{\sin t\int_0^t u(\tau)\cos\tau - \cancel{\int}\cos t\int_0^t u(\tau)\sin\tau\right\}d\tau$$

$$= 1 + \frac{\sin t}{a}\int_0^t u(\tau)\cos\tau\, d\tau - \frac{\cos t}{a}\int_0^t u(\tau)\sin\tau\, d\tau$$

$$u'(t) = \frac{\cos t}{a}\int_0^t u(\tau)\cos\tau\, d\tau + \cancel{\frac{\sin t}{a}\cdot u(t)\cos t}$$

$$+ \frac{\sin t}{a}\int_0^t u(\tau)\sin\tau\, d\tau - \cancel{\frac{\cos t}{a}u(t)\sin t}$$

$$u''(t) = \underbrace{-\frac{\sin t}{a}\int_0^t u(\tau)\cos\tau\, d\tau + \frac{\cancel{\sin t}\ \cos t}{a}\int_0^t u(\tau)\sin\tau\, d\tau}_{= -\left(u(t)-1\right)} + \frac{\cos t}{a}u(t)\cos t + \frac{\sin t}{a}u(t)\sin(t) = \frac{u(t)}{a}$$

$$\therefore\ u'' = -u + 1 + \frac{u}{a} = \left(\frac{1}{a} - 1\right)u + 1$$

~~u''~~ $\cdot\, T(0) = 1$ $\qquad u(\pi) = 1 + \frac{1}{a}\int_0^\pi u(\tau)\underbrace{\sin(\pi - \tau)}_{\sin z}d\tau.$

No. (i) $a_i^T d \leq 0 \ (\forall i) \Rightarrow d = 0$

Date $d \neq 0 \Rightarrow a_i^T d > 0 \ (\exists i)$

$v \in P, \ x^1 \in P, x^2 \in P, \ v = \frac{1}{2}x^1 + \frac{1}{2}x^2, \quad x^1 \neq x^2$

$a_i^T v \leq b_i$

$a_i^T x^1 \leq b_i \quad (i = 1, \cdots, m)$

$a_i^T x^2 \leq b_i$

$a_i^T v = b_i \quad (i \in I(v))$

$a_i^T x^1 = b_i \quad (i \in I(x^1))$

$a_i^T x^2 = b_i \quad (i \in I(x^2))$

$a_i^T (x^1 - x^2) \leq 0 \ (i = 1, \cdots, m) \Rightarrow x^1 = x^2$?

$x^1 - x^2 \neq 0$

$a_i^T \frac{1}{2} x^1 \leq \frac{b_i}{2}$

$a_i^T \frac{1}{2} x^2 \leq \frac{1}{2} b_i$

$a_i^T (\underbrace{\frac{1}{2}x^1 + \frac{1}{2}x^2}_{v}) \leq b_i \quad (i \in I(x^1) \cap I(x^2))$

$a_i^T (x^1 - x^2) \neq 0 \quad (i \in I(x^1) \cap I(x^2))$