→ SPNS – 3/7/216 – FLEC Book – Lecture 3

→ $y_1(t) = 7x_1(t)$

$y_2(t) = 2x_2(t)$

If $x_1 = 1$ $\quad x_1 + x_2 = 3$
$x_2 = 2$

Then $y_1 = 7$ $\quad y_1 + y_2 =$
$y_2 = 4$

$y_1 + y_2 = 11$

→ Additivity

$f: \quad y = 7x$

$x_1 = 1 \longrightarrow y_1 = 7$
$x_2 = 3 \qquad y_2 = 21$

$y_1 + y_2 = 28$

$x_1 + x_2 = 4$

$y = 7(1+3) \rightarrow y = 7(4) = 28$

→ SUPERPOSITION

$y = \pi x$

$x_1 = 1 \quad \rightarrow \quad y_1 = \pi$

$x_2 = \pi/2 \quad y_2 = \pi^2/2$

$a = 4$

$b = 6$

$x_1(t) = a x_1(t) + b x_2(t)$

$x_1^*(t) = 4(1) + 6(\pi/2)$

$= 4 + 3\pi$

$y_1^*(t) = a y_1(t) + b y_2(t)$

$= 4(\pi) + 6(\pi^2/2)$

$= 4\pi + 3\pi^2$

$y = \pi x$

$= \pi(4 + 3\pi)$

$= 4\pi + 3\pi^2$

$$y = \pi x + 1$$

$x_1 = 1 \quad \rightarrow \quad y_1 = \pi + 1$

$x_2 = \pi/2 \qquad y_2 = \pi^2/2 + 1$

$a = 4$

$b = 6$

$$x^*(t) = a\,x_1(t) + b\,x_2(t)$$
$$= 4(1) + 6(\pi/2) =$$
$$= 4 + 3\pi$$

$$y^*(t) = a\,y_1(t) + b\,(y_2(t))$$
$$= 4(\pi + 1) + 6(\pi^2/2 + 1)$$
$$= 4\pi + 4 + 3\pi^2 + 6$$
$$= 4\pi + 3\pi^2 + 10$$

$$y^* = \pi(x^*) + 1$$
$$= \pi(4 + 3\pi) + 1$$
$$= 4\pi + 3\pi^2 + 1$$