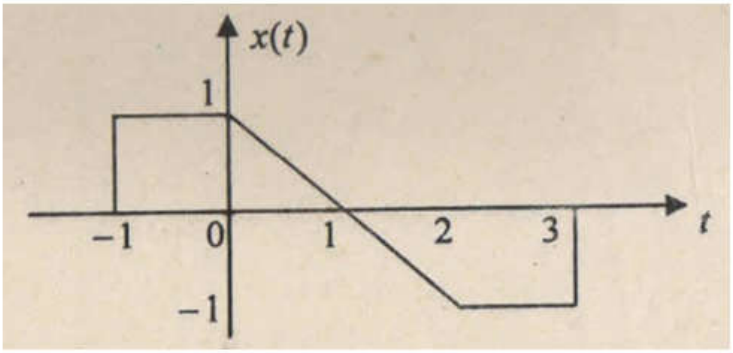
Discussion problem assignment:

第一题：

2. Given the following signal $x(t)$, do the following:

(a) Find $\angle X(j\omega)$, the phase of the spectrum

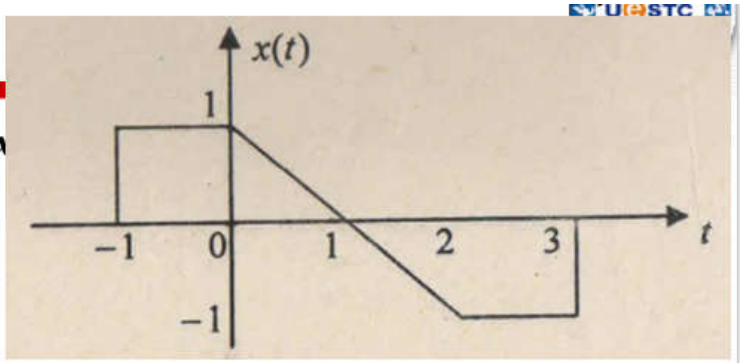
(b) Find $X(j\omega)|_{\omega=0}$



答案：

2. Given the following signal x

(a) Find $\angle X(j\omega)$



The signal $y(t) = x(t+1)$ is real and odd, so the spectrum $Y(j\omega)$ is purely imaginary. $\angle Y(j\omega) = \pm\frac{\pi}{2}$

$$x(t) = y(t-1),\quad X(j\omega) = Y(j\omega)e^{-j\omega} \qquad \angle X(j\omega) = -\omega \pm \frac{\pi}{2}$$

(b) Find $X(j\omega)|_{\omega=0}$

$$X(j\omega)|_{\omega=0} = \int_{-\infty}^{+\infty} x(t)e^{-j\omega t}dt\,|_{\omega=0} = \int_{-\infty}^{+\infty} x(t)dt = 0$$ **Due to odd signal**