第五次作业

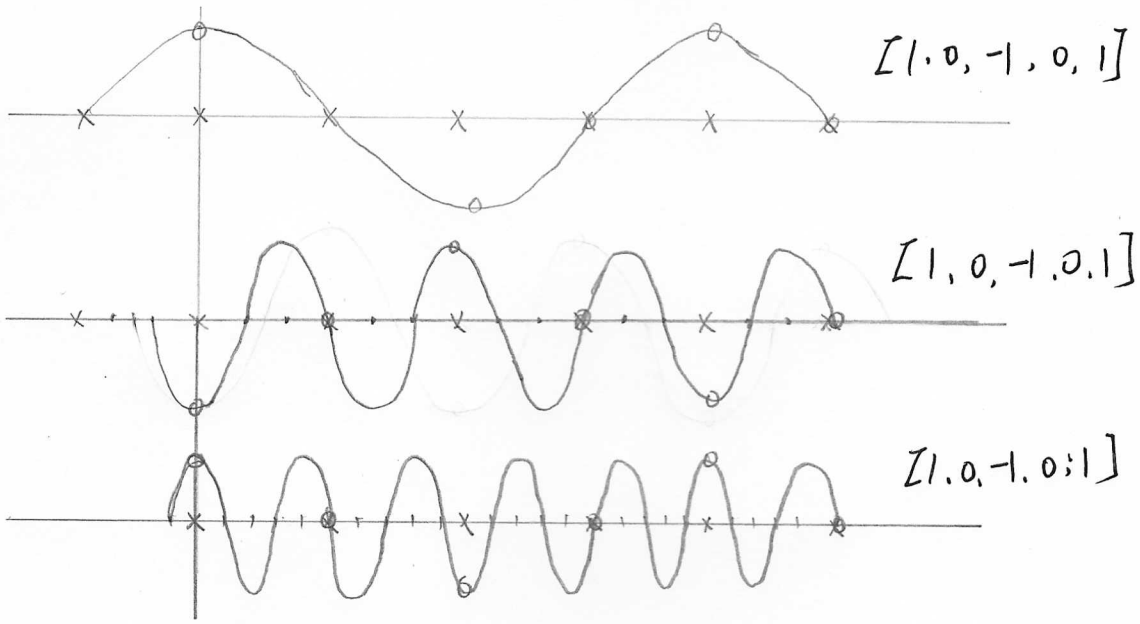
p186.

2、$T=\frac{2\pi}{\Omega}=\frac{1}{4}$.

则 $X_{as}(t)=\sum_{n=-\infty}^{\infty}X_{a1}(nT)\cdot\delta(t-nT)=\sum_{n=-\infty}^{\infty}\cos(\frac{n\pi}{2})\cdot\delta(t-\frac{1}{4}n)$

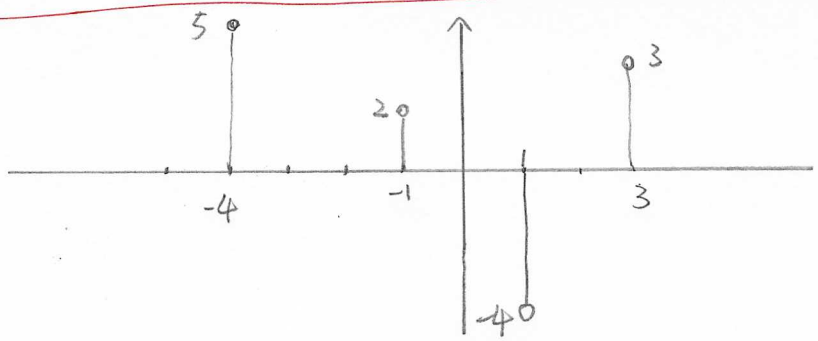
$X_{a2s}(t)=\sum_{n=-\infty}^{\infty}X_{a2}(nT)\cdot\delta(t-nT)=-\sum_{n=-\infty}^{\infty}\cos(\frac{5}{2}n\pi)\cdot\delta(t-\frac{1}{4}n)$

$X_{a3s}(t)=\sum_{n=-\infty}^{\infty}X_{a3}(nT)\cdot\delta(t-nT)=\sum_{n=-\infty}^{\infty}\cos(\frac{5}{2}n\pi)\cdot\delta(t-\frac{1}{4}n)$



三个信号经采样后输出信号一样，无法区分，频谱混叠。

4.



$X(n)=5\delta(n+4)+2\delta(n+1)-4\delta(n-1)+3\delta(n-3)$

1). $T_s=\frac{1}{f_s}=\frac{1}{1000}$

则：$X_s(n)=A\cdot\cos(200\pi\cdot n\cdot\frac{1}{1000})+B\cdot\cos(500\pi\cdot n\cdot\frac{1}{1000})$

$=A\cdot\cos(\frac{2}{10}n\pi)+B\cos(\frac{5}{10}\pi n)$

则 $\Omega_0=\frac{1}{10}\pi$　　$N=\frac{2\pi}{\Omega_0}=20$.

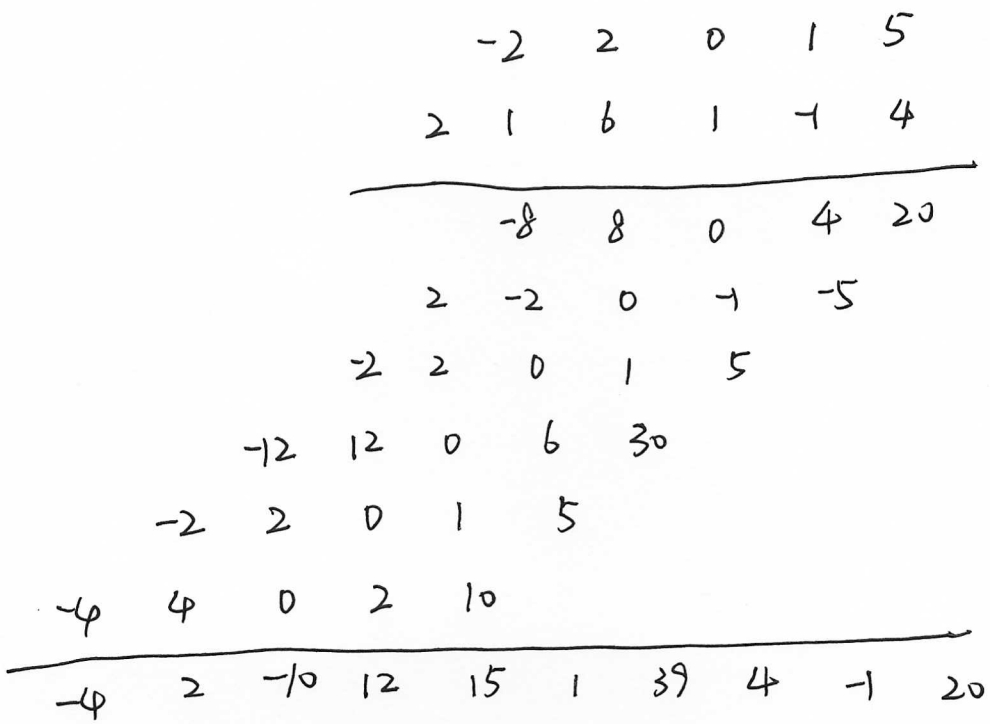
$X(k\Omega_0)=\frac{1}{20}\sum_{n=0}^{N-1}(A\cdot\cos\frac{1}{5}n\pi+B\cdot\cos\frac{1}{2}n\pi)\cdot e^{-j\cdot k\cdot\frac{2\pi}{10}\cdot n}$.

补充题：

$h(n)=\{-2, 2, 0, 1, 5\}$.

$x(n)=\{2, 1, 6, 1, -1, 4\}$.

求 $h(n)*x(n)$.



$h(n)*x(n)=\{-4, 2, -10, 12, 15, 1, 39, 4, -1, 20\}$