Lektion 10

9.2-3 **(a)** $X\left[\Omega\right]=1$ **(b)** $X\left[\Omega\right]=e^{-j\Omega k}$ **(c)** $X\left[\Omega\right]=\dfrac{\gamma}{e^{j\Omega}-\gamma}$

(d) $X\left[\Omega\right]=\dfrac{e^{j2\Omega}}{\gamma\left(e^{j\Omega}-\gamma\right)}$

9.2-4 **(a)** $x\left[n\right]=\delta\left[n+k\right]$ **(b)** $x\left[n\right]=\dfrac{1}{2}\left(\delta\left[n+k\right]+\delta\left[n-k\right]\right)$

(c) $x\left[n\right]=\dfrac{1}{2}\delta\left[n\right]+\dfrac{1}{4}\left(\delta\left[n+1\right]+\delta\left[n-1\right]\right)$ **(e)** $x\left[n\right]=e^{j\Omega_0 n}$

(f) $x\left[n\right]=\cos\left(\Omega_0 n\right)$

9.2-10 **(a)** $x\left[\Omega\right]=3+4\cos\left(\Omega\right)+2\cos\left(2\Omega\right)$ **(b)** $x\left[\Omega\right]=e^{-3j\Omega}\left(3+4\cos\left(\Omega\right)+2\cos\left(2\Omega\right)\right)$

9.2-11 **(a)** $x\left[n\right]=\dfrac{\Omega_0}{\pi}\operatorname{sinc}_{\mathrm{N}}\left(\dfrac{\Omega_0}{\pi}\left(n-n_0\right)\right)=\dfrac{\Omega_0}{\pi}\operatorname{sinc}\left(\Omega_0\left(n-n_0\right)\right)$

(b) $x\left[n\right]=\dfrac{1-\cos\left(\Omega_0 n\right)}{\pi n}$

9.2-14 **(a)** Nej **(b)** Ja **(c)** Ja **(d)** Nej **(e)** Nej

9.3-1 **(b)** $X\left[\Omega\right]=\dfrac{e^{j\Omega\left(1-m\right)}}{e^{j\Omega}-a}$ **(c)** $X\left[\Omega\right]=\dfrac{a^{-3}e^{j\Omega}\left(1-a^{10}e^{-j10\Omega}\right)}{e^{j\Omega}-a}$

(d) $X\left[\Omega\right]=\dfrac{a^{-m}e^{j\Omega}}{e^{j\Omega}-a}$ **(e)** $X\left[\Omega\right]=\dfrac{a^{m}e^{j\Omega\left(1-m\right)}}{e^{j\Omega}-a}$

9.3-4 **(a)** $X\left[\Omega\right]=\dfrac{e^{j\Omega}\left(e^{j\Omega}-a\cos\Omega_0\right)}{e^{j2\Omega}-2ae^{j\Omega}\cos\Omega_0+a^2}$

9.4-1 $y[n]=\left(2(-0.5)^n-\frac{8}{3}(-0.8)^n+\frac{2}{3}(-0.2)^n\right)u[n]$

9.4-2 $y[n]=\left(0.611-\frac{1}{6}(-0.2)^n-\frac{4}{9}(-0.8)^n\right)u[n]$

Anm: I bokens lösningsförslag bör $\frac{e^{j\Omega}}{e^{j\Omega}-1}+\pi\delta(\Omega)$ bytas ut mot

$\mathrm{vp}\left\{\frac{e^{j\Omega}}{e^{j\Omega}-1}\right\}+\pi\sum_{k=-\infty}^{\infty}\delta(\Omega-k2\pi)$ - se formelsamlingen, Tab. 8:3!

9.4-4 **(a)** $h[n]=u[n],\qquad H[\Omega]=\mathrm{vp}\left\{\frac{e^{j\Omega}}{e^{j\Omega}-1}\right\}+\pi\sum_{k=-\infty}^{\infty}\delta(\Omega-k2\pi)$

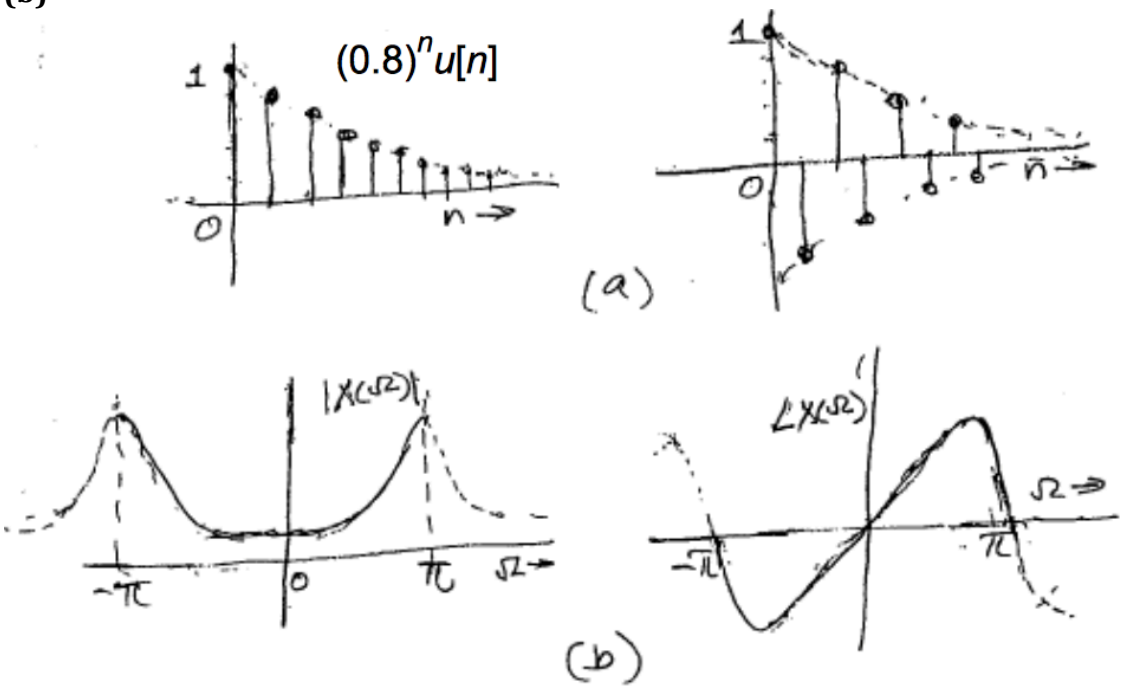
9.4-5 **(a)** $y[n]=\mathrm{sinc}_{\mathrm{N}}\left(\frac{n-2}{2}\right)=\mathrm{sinc}\left(\frac{\pi(n-2)}{2}\right)$

(b) $y[n]=\frac{1}{2}\mathrm{sinc}_{\mathrm{N}}\left(\frac{n-2}{2}\right)=\frac{1}{2}\mathrm{sinc}\left(\frac{\pi(n-2)}{2}\right)$

(c) $y[n]=\mathrm{sinc}_N^2\left(\frac{n-2}{4}\right)=\mathrm{sinc}^2\left(\frac{\pi(n-2)}{4}\right)$

9.4-6 **(a)** Se lösningen

(b)



9.4-7 $H_1[\Omega]=H[\Omega-\pi]\quad\Rightarrow\quad h_1[n]=(-1)^n h[n]$ (se formelsamlingen, Tab. 7:7)