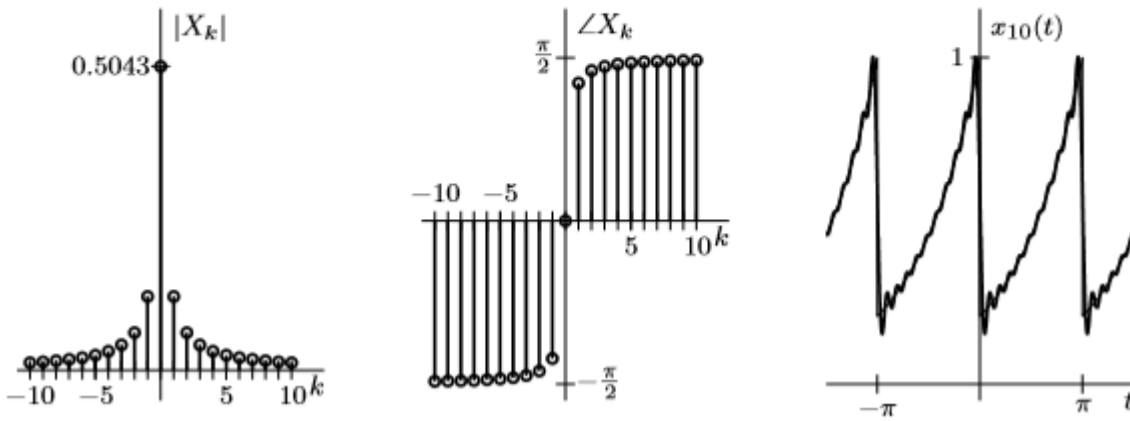


Answer Key to HW 0 (Ch 1 and 2)

1)

$$X_k = \frac{2(1 - e^{-\pi/2})}{\pi(1 - jk4)}. \quad x(t) = \sum_{k=-\infty}^{\infty} \frac{2(1 - e^{-\pi/2})}{\pi(1 - jk4)} e^{jk\omega_0 t}.$$



2)

$$X_b(\omega) = \frac{3 - e^{-j\omega} - 2e^{-j2\omega}}{j\omega}.$$

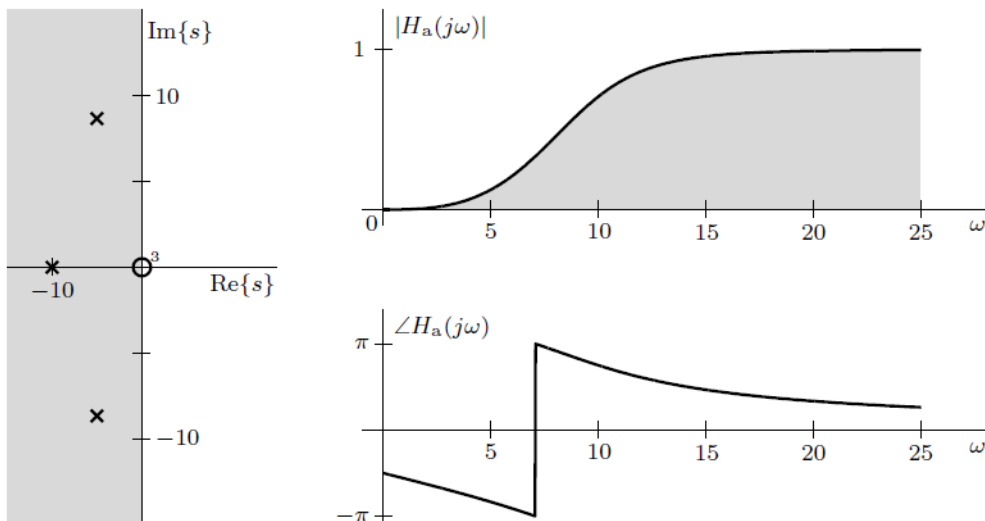
3a)

$$y(t) = \frac{90}{\sqrt{85}} \sin(3t - 1.3963 - 0.8622) = 9.7619 \sin(3t - 2.2584)$$

3b)

$$y(t) = e^{-t} (\cos(2t) + 2 \sin(2t)).$$

4)



5)

$$|H(j\omega)| = \left| \frac{j\omega - 2}{j\omega + 2} \right| = \frac{\sqrt{\omega^2 + 4}}{\sqrt{\omega^2 + 4}} = 1$$

$$\angle H(j\omega) = \angle \frac{j\omega - 2}{j\omega + 2} = \tan^{-1}(\omega/-2) - \tan^{-1}(\omega/2) = \pi - 2 \tan^{-1}(\omega/2).$$

