**P1**   Find the DTFT of $x[n] = 6e^{-2n}u[n-1]$ using tables and properties of the DTFT.
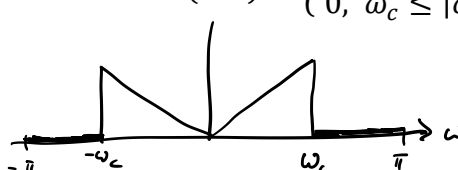
$$x[n] = 6e^{-2n} \, u[n-1]$$

$$= 6e^{-2(n-1)} \, e^{-2} \, u[n-1]$$

$$= 6e^{-2} \left(e^{-2}\right)^{n-1} u[n-1] \quad \text{but} \quad 6e^{-2}\left(e^{-2}\right)^{n} u[n] \Longleftrightarrow \frac{6e^{-2}}{1-e^{-2}e^{-j\omega}} \text{ by tables}$$

$$= \frac{6e^{-2}}{1-e^{-2}e^{-j\omega}} \, e^{-j\omega}$$

$$= \boxed{\frac{6 \, e^{-(2+j\omega)}}{1-e^{-(2+j\omega)}}}$$

**P2**   Find the IDTFT of $X(e^{j\omega}) = 1 + 2\cos(\omega)$.
        Hint: use Euler's identities to make it a complex exponential).

$$X(e^{j\omega}) = 1 + 2\cos\omega$$

$$= 1 + \left[e^{j\omega} + e^{-j\omega}\right]$$

$$\boxed{x[n] = \delta[n] + \delta[n+1] + \delta[n-1]}$$

**P3**   Without computing the IDTFT, determine if x[n] is an even or odd sequence if

$$X(e^{j\omega}) = \begin{cases} |\omega|, & 0 \le |\omega| \le \omega_c \\ 0, & \omega_c \le |\omega| \le \pi \end{cases}$$



$$\Rightarrow X(e^{j\omega}) \text{ is purely } \underline{real}$$
$$\text{so}$$
$$\boxed{x[n] \text{ is even}}$$