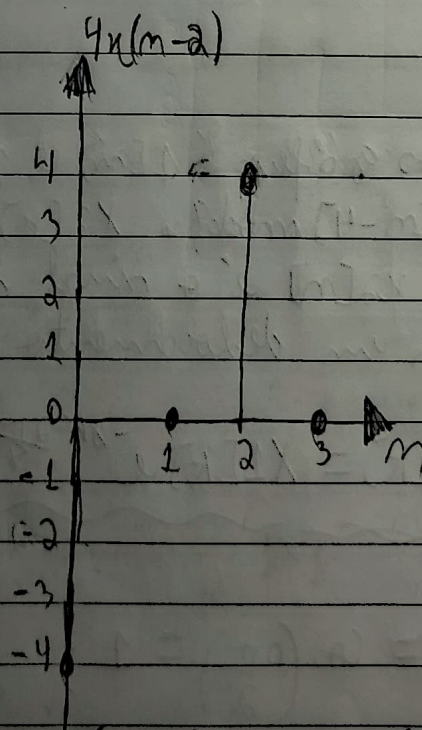
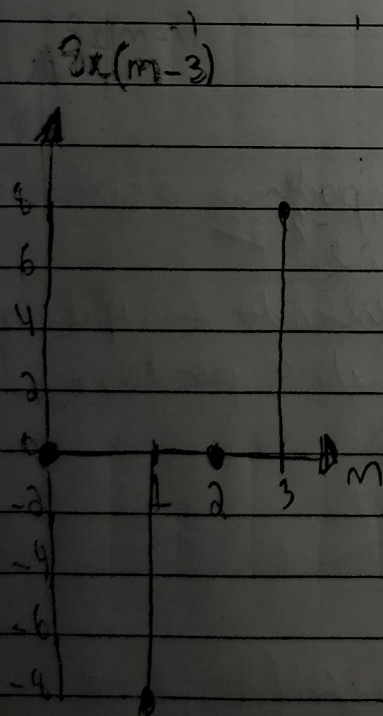
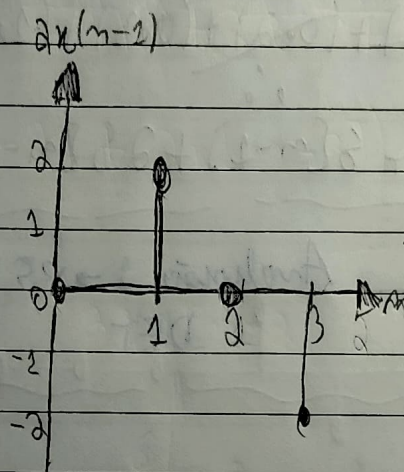
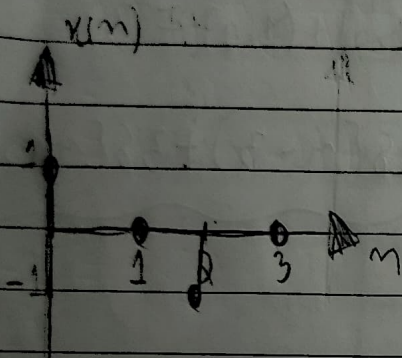


2. d) $Y[k] = X[k] \cdot H[k]$

$$Y[k] = X[k] + 2X[k]e^{-j2k\pi \cdot 1} + 4X[k]e^{-j2k\pi \cdot 2} + X[k]2e^{-j2k\pi \cdot 3}$$

$$y[n] = x[n] + 2x[n-2] + 4x[n-2] + 8x[n-3] \text{ mod } 4$$



$$y[n] = (1-4)\delta[n] + (2-8)\delta[n-1] + (-1+4)\delta[n-2] + (-2+8)\delta[n-3]$$

$$y[n] = -3\delta[n] - 6\delta[n-1] + 3\delta[n-2] + 6\delta[n-3]$$