3) $B_2 = \{2, x-1\}$
$D_4 = \{(-1,-1), (0,0), (1,1), (2,8)\}$

$y = f(x) = mx+b$
$f(-1) = -m+b = -1$
$f(0) = \quad +b = 0 \quad \Rightarrow$
$f(1) = m+b = 1$
$f(2) = 2m+b = 8$

$$\underbrace{\begin{bmatrix} -1 & 1 \\ 0 & 1 \\ 1 & 1 \\ 2 & 1 \end{bmatrix}}_{A} \underbrace{\begin{bmatrix} m \\ b \end{bmatrix}}_{x} = \underbrace{\begin{bmatrix} -1 \\ 0 \\ 1 \\ 8 \end{bmatrix}}_{B}$$

$A\vec{x} = B$ has NO solution.

Least squares:
x^*
$A^T A x^* = A^T B$

$A^T = \begin{bmatrix} -1 & 0 & 1 & 2 \\ 1 & 1 & 1 & 1 \end{bmatrix}$

$$\begin{bmatrix} -1 & 0 & 1 & 2 \\ 1 & 1 & 1 & 1 \end{bmatrix} \cdot \begin{bmatrix} -1 & 1 \\ 0 & 1 \\ 1 & 1 \\ 2 & 1 \end{bmatrix} x^* = \begin{bmatrix} -1 & 0 & 1 & 2 \\ 1 & 1 & 1 & 1 \end{bmatrix} \begin{bmatrix} -1 \\ 0 \\ 1 \\ 8 \end{bmatrix}$$

$$\begin{bmatrix} 6 & 2 \\ 2 & 4 \end{bmatrix} x^* = \begin{bmatrix} 18 \\ 8 \end{bmatrix}$$

$$= \begin{bmatrix} 6 & 2 \\ 2 & 4 \end{bmatrix} \begin{bmatrix} m^* \\ b^* \end{bmatrix} = \begin{bmatrix} 18 \\ 8 \end{bmatrix}$$

$$\begin{bmatrix} 6 & 2 & | & 18 \\ 2 & 4 & | & 8 \end{bmatrix} \Rightarrow \begin{bmatrix} 1 & 0 & | & 14/5 \\ 0 & 1 & | & 3/5 \end{bmatrix} \quad \begin{array}{l} m^* = 14/5 \\ b^* = 3/5 \end{array}$$

$$x^* = \begin{bmatrix} 14/5 \\ 3/5 \end{bmatrix} \Rightarrow \boxed{y = 14/5\, x + 3/5}$$