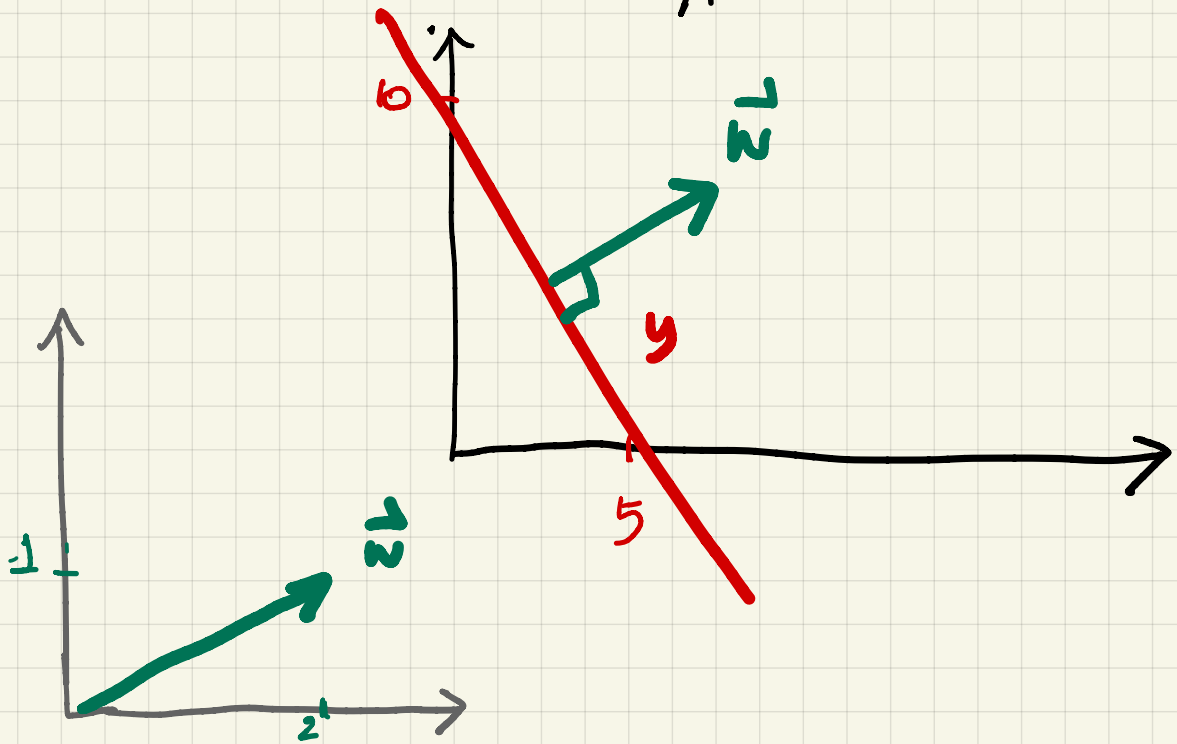
Quiz (a): Find the vector $\vec{w}$ and offset b that defines the line (2D-hyperplane) $y = -2x + 10$



Let $w = \begin{pmatrix} w_1 \\ w_2 \end{pmatrix} \Rightarrow w^T \begin{pmatrix} x \\ y \end{pmatrix}$

$= w_1 x + w_2 y$

So, $w_2 = 1$, $w_1 = 2$, $b = -10$

$y = -2x + 10 \iff y + 2x - 10 = 0$

$H = \{(x, y) \mid y + 2x - 10 = 0\} = \{(x, y) \mid \vec{w}^T \begin{pmatrix} x \\ y \end{pmatrix} + b = 0\}$