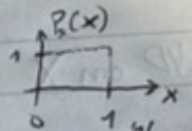
Assumptions: $\cancel{*}S = \cancel{*}X$

$S = WX$

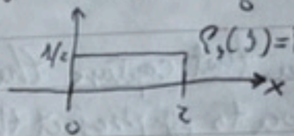
$S_j \perp S_k, \; j \neq k.$ (Independence)

S_j is NOT Gaussian

$X \sim \text{Uniform}(0,1)$



$y = 2x$



$P_y(y) = P_x(y/2)\frac{1}{2}$

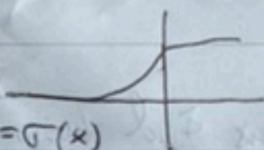
now $x \in \mathbb{R}^d$

$\underset{\mathbb{R}^d}{y} = \underset{\mathbb{R}^{d\times d}}{W}x$ $\quad P_y(y) = P_x(W^{-1}y)\frac{1}{|W|}$ Jacobian

$$P(x) = \prod_{j=1}^{d} P_s(w_j^T x) \cdot |W|$$

$$W = \begin{bmatrix} — w_j — \\ \\ \end{bmatrix}$$ unmixing matrix

If $P_s \sim$ logistic distribution



CDF of s: $F(x) = \frac{1}{1+e^{-x}} = \sigma(x)$

pdf of $F(x) = \sigma(x)(1-\sigma(x))$

$$\ell(W) = \sum_{i=1}^{n}\left[\sum_{j=1}^{d}\left(\log\left[\sigma(w_j^T x^i)\,(1-\sigma(w_j^T x^i))\right]\right) + \log|W|\right]$$

$$\Rightarrow W := W + \alpha \begin{bmatrix} 1-2\sigma(w_1^T x^i) \\ 1-2\sigma(w_2^T x^i) \\ \vdots \end{bmatrix} x^{iT} + (W^T)^{-1}$$

$\frac{d|x|}{dx} = \text{sign}(x)$