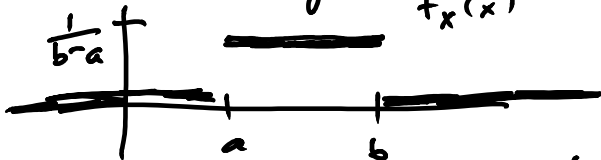


# Continuous uniform random variable

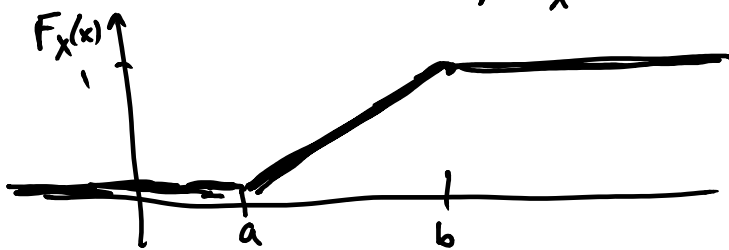
Say  $X$  is a continuous uniform random variable if  $X$  has a constant density on the interval where  $X$  has its density nonzero, say  $[a, b]$ . The density, then, must be  $f_X(x) = \frac{1}{b-a}$  on that interval and 0 otherwise, because we need  $1 = \int_{-\infty}^{\infty} f_X(x) dx = \int_a^b \boxed{\text{const.}} dx = \text{const.} \cdot (b-a)$

So the density looks like:

$$\text{So const.} = \frac{1}{b-a}$$



What about the CDF,  $F_X(x)$ ?



$$F_X(x) = \begin{cases} \frac{x-a}{b-a} & \text{for } a < x < b \\ 0 & x \leq a \\ 1 & x \geq b \end{cases}$$