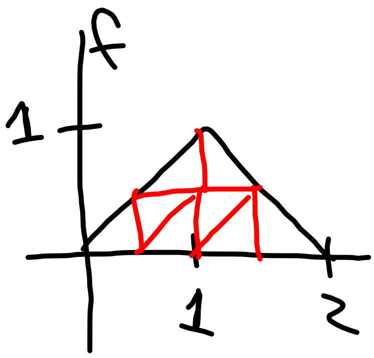


$P(X > \frac{1}{2}) = \frac{7}{8}$

$P(X > \frac{1}{2}) = \int_{\frac{1}{2}}^{\infty} f(x)\,dx$

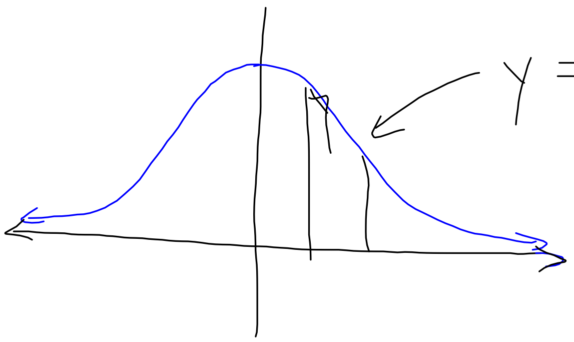
$$f(x) = \begin{cases} 0 & \text{if } x < 0 \\ x & \text{if } 0 \le x < 1 \\ 2 - x & \text{if } 1 \le x < 2 \\ 0 & \text{if } x \ge 2 \end{cases}$$

$P(X = \frac{1}{2}) = \int_{\frac{1}{2}}^{\frac{1}{2}} x\,dx = 0$

$$= \int_{\frac{1}{2}}^{1} x\,dx + \int_{1}^{2} (2-x)\,dx$$

$$= \frac{1}{2}x^2 \Big|_{\frac{1}{2}}^{1} + \Big[2x - \frac{1}{2}x^2\Big]_{1}^{2}$$

$$= \left(\frac{1}{2} - \frac{1}{8}\right) + \Big[\underbrace{(4-2)}_{2} - \underbrace{\left(2-\frac{1}{2}\right)}_{-\frac{3}{2}}\Big] = \frac{3}{8} + \frac{1}{2} = \frac{7}{8} \text{ (Hooray!)}$$



$y = e^{-x^2}$

$$\int_{.1}^{.5} e^{-x^2}\,dx$$

$S = \{1, 2, 3, 4, 5, 6\}$

$X(1) = 3$ $\quad$ $Ran(X)$

$X(5) = 4$

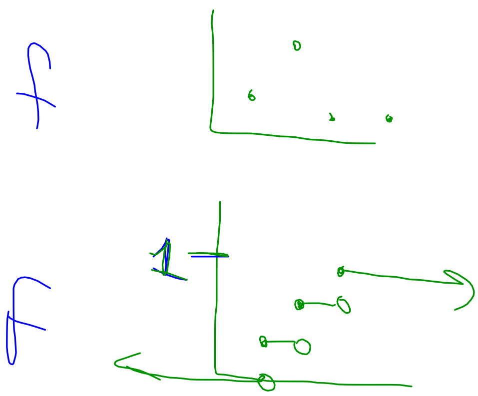
1. Finish assignment
2. Work on Section 2.4

Discrete Continuous

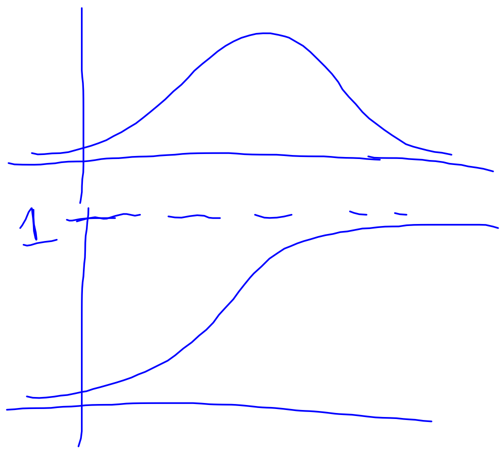
$\sum f(x)$ $\int f(x)\,dx$

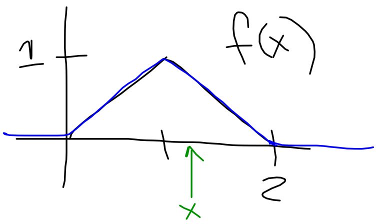
$$\int_a^b f(x)\,dx = \lim \sum f(x)\Delta x$$

Discrete



Continuous





F ?

$$F(x) = \int_{-\infty}^{x} f(t)\,dt$$

$$f(x) = \begin{cases} 0 & \text{if } x < 0 \\ x & 0 \le x < 1 \\ 2 - x & 1 \le x < 2 \\ 0 & x > 2 \end{cases}$$

$F(0) = 0$ $F(2.1) = 1$

$F(-\pi) = 0$ $F(2) = 1$

$F(1) = \frac{1}{2}$

for $0 \le x < 1$, $F(x) = \int_0^x t\,dt = \frac{t^2}{2}\Big|_0^x = \frac{x^2}{2}$

$2t - \frac{t^2}{2}$

for $1 \le x \le 2$, $F(x) = \int_{-\infty}^x f(t)\,dt = \int_0^1 t\,dt + \int_1^x (2-t)\,dt$

$$F(x) = \begin{cases} 0 & \text{if } x < 0 \\ \frac{1}{2}x^2 & \text{if } 0 \le x < 1 \\ -\frac{1}{2}x^2 + 2x - 1 & \text{if } 1 \le x < 2 \\ 1 & \text{if } x > 2 \end{cases}$$

$= \frac{1}{2} + 2x - \frac{x^2}{2} - \frac{3}{2}$

$= -\frac{1}{2}x^2 + 2x - 1$