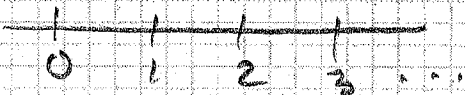


EXPECTED VALUE (Stats for Engineers)

Discrete variables

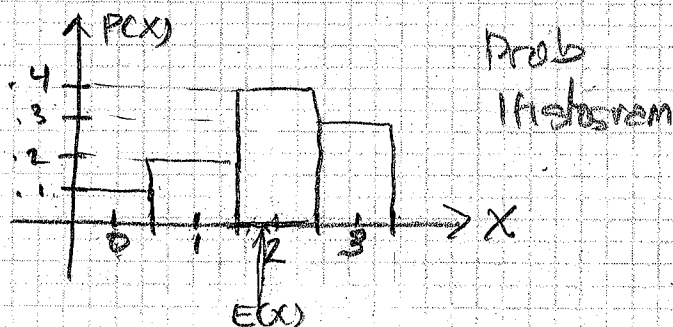


Whole number

Ex:

X	0	1	2	3
P(X)	.1	.2	.4	.3

$$\sum P(X) = 1$$



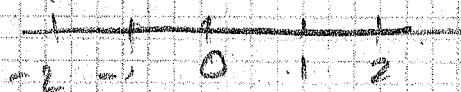
EXPECTED VALUE

$$E(X) = \sum [X \cdot P(X)]$$

$$= 0 \cdot .1 + 1 \cdot .2 + 2 \cdot .4 + 3 \cdot .3$$

$$= 1.9$$

Continuous Variables



Weight, volume

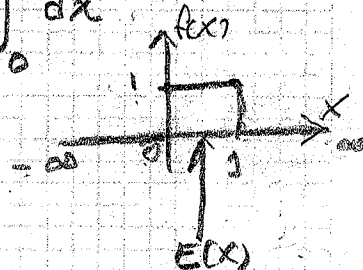
12 to 13
12.5

Ex: $f(x) = \begin{cases} 1 & \text{for } 0 \leq x \leq 1 \\ 0 & \text{elsewhere} \end{cases}$

$$\int_{-\infty}^{\infty} f(x) dx = \int_0^1 dx$$

$$= x \Big|_0^1 =$$

$$= 1 - 0 = 1$$



EXPECTED VALUE

$$E(X) = \int_{-\infty}^{\infty} x \cdot f(x) dx =$$

$$= \int_0^1 x dx = \frac{x^2}{2} \Big|_0^1 = \frac{1}{2} - \frac{0}{2} = \frac{1}{2}$$