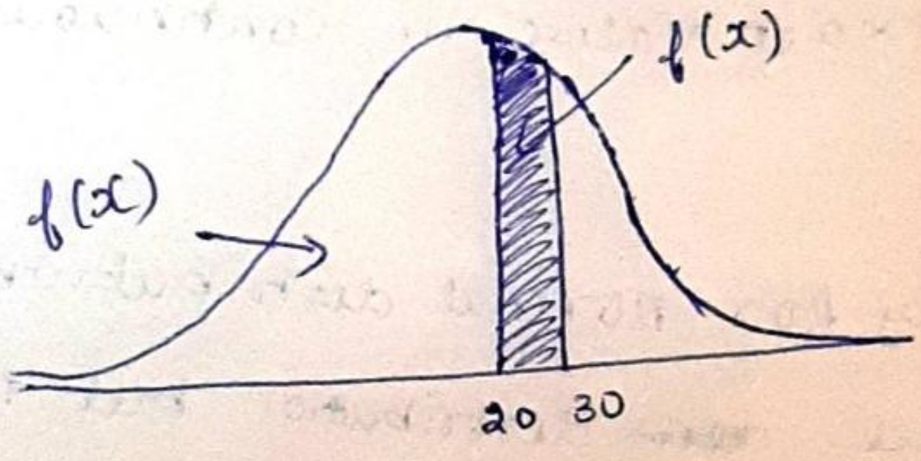
1. Probability density Function (PDF)

* Probability density function of continuous random is defined as from negative infinity to Positive infinity the total area = 1

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

* It is also defined as the area under the curve between 2 intervals.

$$P(a \le x \le b) = \int_{a}^{b} f(x)\,dx$$



* Both are considered as the probability density function.

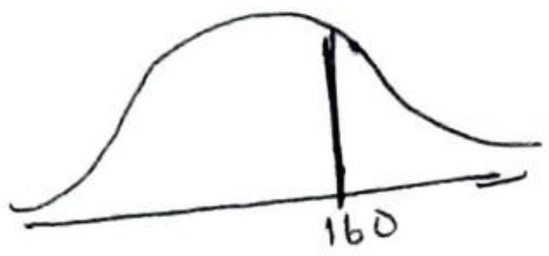
* $P(X = x)$ in a continuous distribution is always Zero. For example in a class if ask the probability of students with weight exactly = 85 Kg the answer is zero.

$$P(x = 80) = 0.$$

* It is because the PDF is defined for the area under the curve, which means we can

~~which the dist is~~

find Prob distribution within the certain intervals ~~not~~, ~~but~~ or $-\infty$ to ∞, but we cannot find exactly at a point



$P(X = 160) = 0$

~~because~~
because there is no area under curve

* To understand it more easily, if i ask in class weight of student exactly 85, it is ~~zero~~ zero because the weight of student may be 85.1 or 85.123...., so the Probability of exact value in continuous data is zero.

* PDF is not only for normal distribution, it is applied for all ~~data~~ distribution but the ~~sum~~ area should equal to 1.