

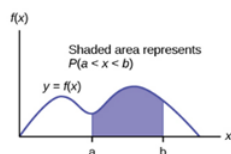
Ch 5.1 Continuous Random Variable and Density Curve

Ch 5.1 Continuous random variable

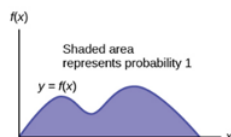
A) Density Curve

Probability of a Continuous Random Variable X is defined by its Probability Density Function(pdf) or density curve: $f(x)$ so that

- Area under the density curve corresponds to probability or relative frequency (percent).



- Total area under the density curve is equal to 1



- the graph is always above x-axis.

Probability = Area = Percent

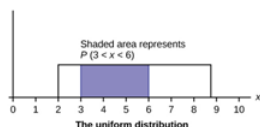
Two important continuous Probability Distributions

1) Uniform Distribution – The probability of X is equally likely to occur. Histogram of sample data usually bars of similar heights. There is lowest and highest value of X .

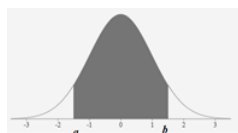
Ex1. X is modeled by Uniform Distribution for

lowest 2 and highest 8.8.

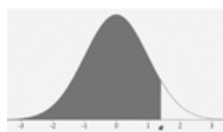
Probability that X is between 3 and 6 is the shaded area under the density curve.



b) Normal Distribution

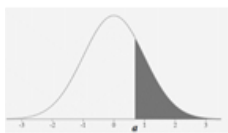


Probability that X is between a and b =
the area under the bell curve for $x = a$ and $x = b$.



Shaded left area =
probability that x is less than a .

Shaded right area =
probability that x is greater than a .



Notation and property of probability of Continuous random variable X .

Probability that $X = a$: $P(X = a) = 0$

Probability that X is between a and b :

$P(a < X < b)$ or $P(a \leq X \leq b)$

Probability that X is less than a : $P(X < a) = P(X \leq a)$

Probability that X is greater than a : $P(X > a) = P(x \geq a)$

Ch 5.1 Continuous Random Variable and Density Curve is shared under a [not declared](#) license and was authored, remixed, and/or curated by LibreTexts.