a mean of 0 and standard
of 1. Also called standard normal
distribution.

⇒ Normal Distribution -

It is defined by the (P.d.f)
Probability density function.

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-[(x-\mu)^2/2\sigma^2]}$$

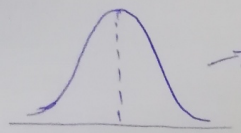
for $-\infty < x < \infty$
and $\sigma > 0$

Where μ is the mean, σ (sigma) is the standard deviation and $\pi = 3.1416$ and $e = 2.7183$ are constant.
It has 2 parameter μ and σ, its mean and standard deviation.

* Normal distribution having mean μ and variance σ^2 is usually denoted by $N(\mu, \sigma^2)$
Thus we also said that a random variable X is normally distributed with mean (μ) and variance (σ^2) i.e.

$$X \sim N(\mu, \sigma^2)$$

* The graph of normal dist, which is symmetrical bell shaped curve, is called Normal curve. The location & shape of the normal curve is determined by μ & σ



→ Normal curve.

Assignment — Importance of Normal Distribution what is its importance in research.

⇒ Standardized Normal Distribution

Normal Probability dist depends on the values of Parameter μ and σ^2 and the various possible values for these 2 parameter. will result in un limited no. of diff Normal dist. The r.v. $Z = \frac{X-\mu}{\sigma}$, and having zero mean & unit variance. Every normally dist r.v X with mean $= \mu$ & var $= \sigma^2$ is ∴ transformed into a new normal r.v Z.

So the P.d.f of Z denoted $\phi(z)$

$$\phi(z) = \frac{1}{\sqrt{2\pi}} e^{-z^2/2} \quad \text{for } -\infty < z < \infty$$

so the normal probability dist of Z which has zero mean and unit variance is called Standardized normal dist or unit normal dist and is denoted by $N(0,1)$.

Properties

1) Mean ⇒ $E(X) = \mu$.
2) variance ⇒ $\text{var}(X) = \sigma^2$
3) mean = mode = median i.e unimodal

⇒ Standardizing a distribution.

It is a process of transforming a variable to one with a mean of 0 and standard deviation of 1

$$\sim (\mu, \sigma^2) \rightarrow \sim (0,1)$$