Normal Distribution

28 October 2022 12:34

① Mean and median both are equal / centered

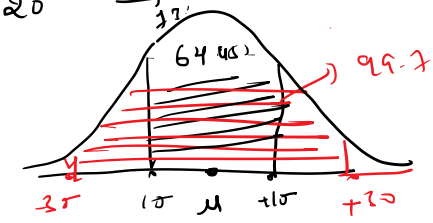
② ND is having symmetrical distribution / bell shaped curve

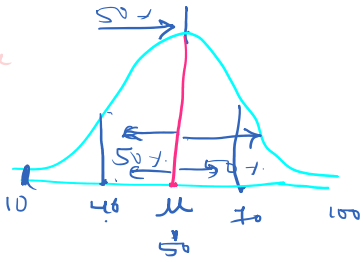
Empirical rule :-

① $\mu \pm 1\sigma$ → 64.45%

② $\mu \pm 2\sigma$ → 95%

③ $\mu \pm 3\sigma$ → 99.73%





$f(x) = \frac{1}{\sigma\sqrt{2\pi}} \cdot e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}$

$\mu = 100$

$\sigma = 10$

$P(x \le 90)$

$\mu - \sigma, \mu + \sigma$

$100 - 10, 100 + 10$

$90, 110$

$\left(\frac{x-\mu}{\sigma}\right)^2$

$\mu + \sigma$

$\mu - \sigma$

Standard ND :- mean = 0, Variance = 1

$Z = \frac{x - \mu}{\sigma} = \frac{90 - 100}{10} = \frac{-10}{10} = -1$

$P(Z \le -1)$

Most graduate schools of business require applicants for admission to take the Graduate Management Admission Council's GMAT examination. Scores on the GMAT are roughly normally distributed with a mean of 527 and a standard deviation of 112. What is the probability of an individual scoring above 500 on the GMAT?

$\mu = 527$

$\sigma = 112$

$P(x > 500)$

$P\left(\frac{x-\mu}{\sigma} > \frac{500 - 527}{112}\right)$

$P\left(Z > \frac{-27}{112}\right)$ ↓

$= 1 - P\left(Z \le \frac{-27}{112}\right)$