

Q: Compute the following probabilities

(a)  $P(Z \leq 1.25)$  (b)  $P(Z > 1.25)$

(c)  $P(Z \leq -1.25)$  (d)  $P(-0.38 \leq Z \leq 1.25)$  ; where  $Z$  is standard normal distn.

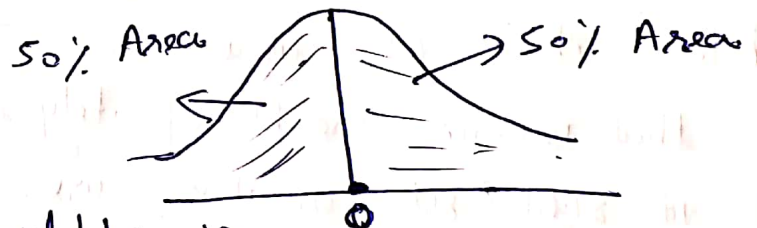
Soln  $P(Z \leq 1.25) = \Phi(1.25) = \int_{-\infty}^{1.25} f_Z(z) dz$

Now see the Table A7 (Normal distribution which I earlier sent).

→ In table value of  $z$  is given and also  $\Phi(z)$  is given.

→ This table gives the area upto point  $z$ .

→  $\Phi(z)$  gives the area upto pt  $z$ .



→ If  $\Phi(z) < 0.5 \Rightarrow z$  should be -ve

→ If  $\Phi(z) > 0.5 \Rightarrow z$  should be +ve

→  $\Phi(0) = 0.5$

Now ;  $\Phi(1.25) = 0.8944$

P.N. (4)

$$\begin{aligned} (b) \quad P(Z > 1.25) &= 1 - P(Z \leq 1.25) \\ &= 1 - \Phi(1.25) \\ &= 1 - 0.8944 \end{aligned}$$

$$\begin{aligned} (c) \quad P(Z \leq -1.25) &= \Phi(-1.25) \\ &= 1 - \Phi(1.25) \quad (\because \Phi(-z) = 1 - \Phi(z)) \\ &= 1 - 0.8944 \end{aligned}$$

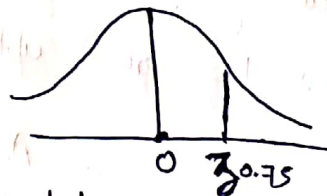
$$\begin{aligned} (d) \quad P(-0.38 \leq Z \leq 1.25) &= \Phi(1.25) - \Phi(-0.38) \\ &= 0.8944 - [1 - \Phi(0.38)] \\ &= 0.8944 - 1 + 0.6480 \end{aligned}$$

Q: Find 75; 95 percentile of standard normal dist<sup>n</sup>?

Sol<sup>n</sup>

Note: percentile is the pt below which required area lies.

Since we are looking for the pt below which 75% area lies that means the pt definitely should be positive that why we took it right side on above curve



$$\int_{-\infty}^{z_{0.75}} f_Z(z) dz = 0.75$$

$$\Rightarrow \Phi(z_{0.75}) = 0.75$$

$$z_{0.75} = 0.67$$

(See in table A0; where ~~the~~ it is given)

$$z_{0.95} = 1.645$$