J78/II/11

$$Y \sim N(10, 2^2)$$

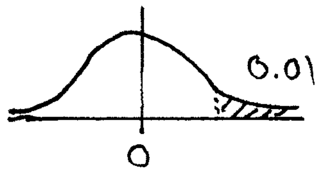
$$\bar{Y} \sim N\left(10, \frac{2^2}{n}\right)$$

Standard deviation of $\bar{Y} = \sqrt{\frac{2^2}{n}} = \frac{2}{\sqrt{n}}$.

$$P(\bar{Y} > 10.1) \leq 0.01$$

$$P\left(Z > \frac{10.1 - 10}{\left(\frac{2}{\sqrt{n}}\right)}\right) \leq 0.01$$

From G.C., $P(Z > 2.32634787) = 0.01$



$$\therefore \quad \frac{10.1 - 10}{\left(\frac{2}{\sqrt{n}}\right)} \geq 2.32634787$$

$$\sqrt{n} \geq \frac{2(2.32634787)}{0.1}$$

$$n \geq 2164.76$$

The least value of n is 2165.

06/NJC/II/25 Modified

Let $\bar{X}$ be the sample mean of 55 independent observations of X.

Since n is large, by Central Limit Theorem,

$$\bar{X} \sim N\left(1.1625, \frac{1.20484}{55}\right) \text{ approx}$$

$$P(\bar{X} > 1.2) = 0.39999 \simeq 0.400 \text{ (3sf)}$$