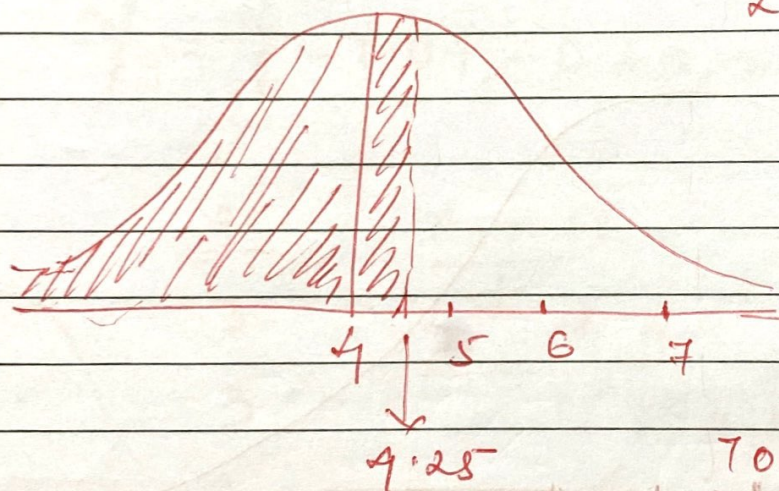


Assignment Section - 5

(1) $x = \{1, 2, 3, 4, 5, 6, 7\}$

what % of score fall above 4.25

$\mu = 4$
 $\sigma = 1$



$$Z \text{ score} = \frac{4.25 - 4}{1}$$

$$= 0.25 \text{ SD}$$

Z table value =

$$0.59871$$

$$\text{Total area} = 1 - 0.59871$$

$$= 0.40129$$

$$= 40.12 \%$$

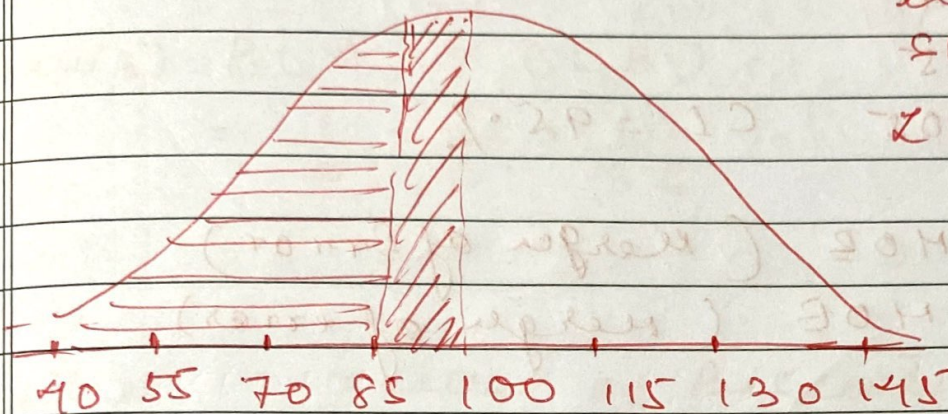
②

In India the average IQ is 100 with a standard deviation of 15.

papergrid

Date: / /

What % of population is expected to have IQ lower than 85



$$\mu = 100$$

$$\sigma = 15$$

$$Z \text{ score} = \frac{x - \mu}{\sigma}$$

$$= \frac{85 - 100}{15}$$

$$= \frac{-15}{15}$$

$$= -1$$

$$Z \text{ table value} = 0.15866$$

$$= 15\%$$

(ii) What % will have IQ higher than 85

$$\text{Ans } 1 - 0.15866$$

$$= 84.13\%$$

(iii) Between 85% - 100%

$$\text{Ans } - 0.5 - 0.15866$$

$$= 0.34134$$

$$= 34\%$$

(iv) Between 100 - 125

$$0.9515 - 0.5$$

$$\frac{125 - 100}{15} = 1.66$$

$$= 0.9515$$

$$\rightarrow = 45\%$$

Question - Size of all the sharks in the world. papergrid

Date: / /

Let's consider

$$n = 40$$

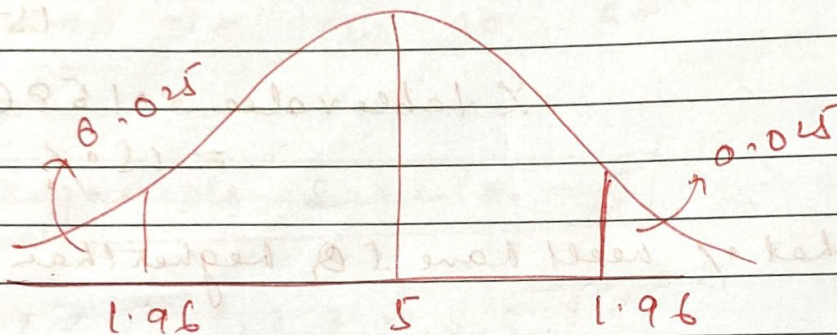
$$\bar{x} = 5.4$$

$$s (SD) = 0.5$$

$$\alpha = 0.05 \quad CI = 95\%$$

$$LF = \bar{x} - MOE \quad (\text{margin of error})$$

$$HF = \bar{x} + MOE \quad (\text{margin of error})$$



$$LF = \bar{x} - Z_{\alpha/2} \left(\frac{s}{\sqrt{n}} \right)$$

$$= 5 - 1.96 \times \frac{0.5}{\sqrt{40}}$$

$$= 5 - 1.96 \times \frac{0.5}{6.32}$$

$$= 5 - 0.15 = 4.85$$

$$HF = \bar{x} + Z_{\alpha/2} \left(\frac{s}{\sqrt{n}} \right)$$

$$= 5 + 0.15 = 5.15$$

So the size of sharks will vary between
 $4.85 \text{ m} \leftrightarrow 5.15 \text{ m}$
with 95% CI.

Question — what is the probability of

rolling a "5" and then "3" with a normal 6x sided die.

$$P(A \text{ and } B) = P(A) \times P(B)$$

$$= \frac{1}{6} \times \frac{1}{6} = \frac{1}{36}$$

[Multiplication Rule
Independent Events]

Question — Probability of Biscuits.

5(A)

6(O)

[10 biscuits
5 are chocolate]

Find the probability $P(A \text{ and } O)$

$$P(A \text{ and } O) = P(A) \times P(O|A)$$

$$= \frac{5}{11} \times \frac{4}{10}$$

$$= \frac{2}{11}$$

Question

$$X = \{1, 2, 3\} - Y = \{3, 4, 6\}$$

Find $\text{Cov}(X, Y)$

$$\text{Cov}(X, Y) = \frac{\sum_{i=1}^N (x_i - \bar{x})(y_i - \bar{y})}{(n-1)}$$

$$\bar{x} = 2 \quad = (1-2)(3-4.3) + (2-2)(4-4.3)$$

$$\bar{y} = 4.3 \quad + \frac{(3-2)(6-4.3)}{2}$$

$$= (-1)(-1.3) + (0)(-0.3) = 1.3$$

$$= 1.3 + 0 + 1.7/2 = \frac{3.0}{2} = 1.5$$