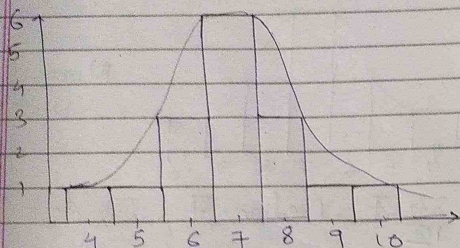


5

* Normal Distribution -

{4, 5, 6, 6, 6, 7, 7, 7, 7, 7, 8, 8, 8, 9, 10}



mean = 7, median = 7, mode = 7
mean = median = mode

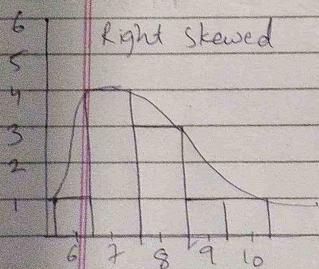
* Right skewed -

{6, 7, 7, 7, 7, 8, 8, 8, 9, 10}

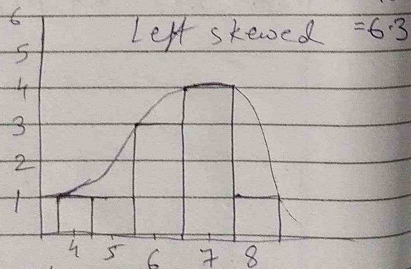
* Left skewed

Mean = $\frac{77}{10} = 7.7$

{4, 5, 6, 6, 6, 7, 7, 7, 7, 8} mean = $\frac{63}{10} = 6.3$



Mean = 7.7, median = 7.5, mode = 7
mean > median > mode



mean = 6.3, median = 6.5, mode = 7
mean < median < mode

4

What is the value of the 99 percentile?

2, 2, 3, 4, 5, 5, 5, 6, 7, 8, 8, 8, 8, 8, 9, 9, 10, 11, 11, 12

99 percentile

$$99^{\text{th}} \text{ Percentile} = \frac{99}{100} \times (n+1)$$

$$= \frac{99}{100} \times (20+1) = \frac{99}{100} \times (21)$$

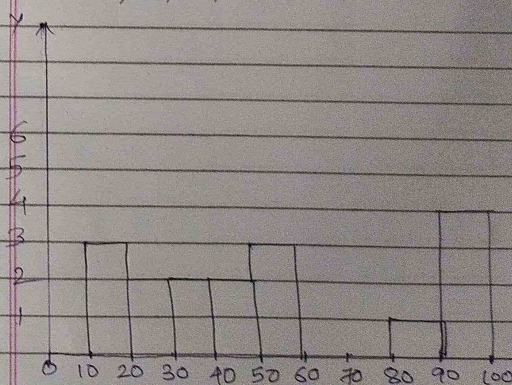
$$= 20.79 \text{ index}$$

$$99^{\text{th}} \text{ percentile} = 12$$

1

Plot a Histogram

10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57, 88, 90, 92, 94, 99

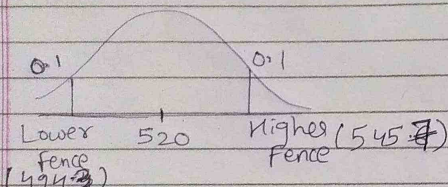


- ② In a quant test of the CAT exam, the population standard deviation is known to be 100. A sample of 25 tests taken has a mean of 520. Construct a 80% CI about the Mean.

$$n=25, \sigma=100, \bar{x}=520, CI=80\%$$

$$\alpha=1-0.80$$

$$\alpha=0.2$$



Z-Test = point estimate \pm Margin of Error

$$\bar{x} \pm Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$$

$$\bar{x} + Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$$

$$520 + Z_{0.2/2} \frac{100}{\sqrt{25}}$$

$$520 + Z_{0.1} \frac{100}{5}$$

$$520 + 1.285 \times 20$$

$$= 494.4$$

Higher fence = 545.7

$$\bar{x} - Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$$

$$520 - Z_{0.2/2} \frac{100}{\sqrt{25}}$$

$$520 - Z_{0.1} \frac{100}{5}$$

$$520 - 1.285 \times 20$$

$$\text{Lower} = 494.4$$

fence

- ③ A car believes that the percentage of citizens in city ABC that owns a vehicle is 60% or less. A sales manager disagrees with this. He conducted a hypothesis testing surveying 250 residents & found that 170 residents responded yes to owning a vehicle

- a) State the null & alternate hypothesis.
- b) At a 10% significance level, is there enough evidence to support the idea that vehicle owners in ABC city is 60% or less

① Null Hypothesis $H_0 = P_0 \leq 60\%$

$$H_1 = P_0 > 60\%$$

② $n=250, x=170$

$$\alpha=0.1$$

$$1-0.1=0.9$$

$$\hat{p} = \frac{x}{n} = \frac{170}{250} = 0.68$$

$$p_0 = 1 - P_0 = 1 - 60\% = 0.4$$

③

