SAMPLING DISTRIBUTION: CT, V, & FORM

<u>Population</u> (N=5) \$10,000; \$12,000; \$14,000; \$16,000; \$18,000

$\mu = \Sigma X_i / N = \$70{,}000/5 = 14{,}000$

$$\sigma = \sqrt{\frac{\Sigma X_i^2 - (\Sigma X_i)^2/N}{N}} = \sqrt{\frac{1{,}020{,}000{,}000 - \frac{(70{,}000)^2}{5}}{5}}$$

$= 2{,}828.43$

<u>SD of $\bar{X}$'s</u> For Samples of Size 2 From a Population of 5 Elements (in \$1,000's): Data Matrix

	10	12	14	16	18
10	10	11	12	13	14
12	11	12	13	14	15
14	12	13	14	15	16
16	13	14	15	16	17
18	14	15	16	17	18

mean of SD

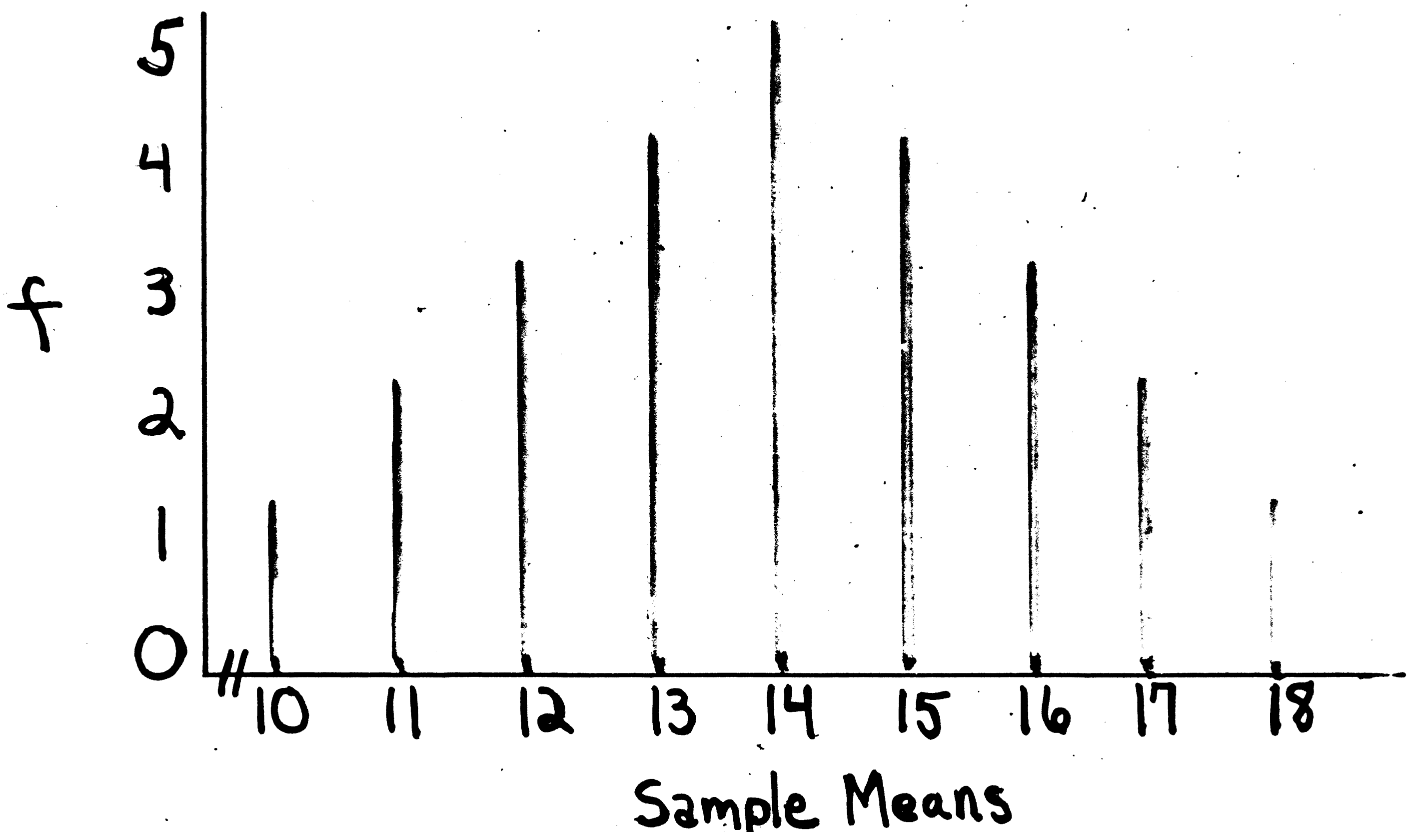
CT: $\mu_{\bar{X}} = \Sigma \bar{X}_i / N = 350/25 = 14$

standard deviation of SD

V: $\sigma_{\bar{X}} = \sqrt{\frac{\Sigma \bar{X}_i^2 - (\Sigma \bar{X}_i)^2/N}{N}} =$

$$\sqrt{\frac{5000 - (350)^2/25}{25}} = 2$$

Form: Central Limit Theorem (CLT)



-NOTE-

CT 1. $\mu = \mu_{\bar{X}}$ $\therefore E(\bar{X}) = \mu$ unbiased estimate

V 2. $\sigma \neq \sigma_{\bar{X}}$ $\therefore E(s) \neq \sigma$ biased estimate

Form 3. Distribution of sample means is normal (CLT)

$$\sigma = \sqrt{\frac{\sum (X_i - \overline{X})^2}{N}}$$

X_i	$\overline{X}$	$X_i - \overline{X}$	$(X_i - \overline{X})^2$
10,000	14,000	-4,000	16,000,000
12,000	14,000	-2,000	4,000,000
14,000	14,000	0	0
16,000	14,000	+2,000	4,000,000
18,000	14,000	+4,000	16,000,000
		$\sum = 0$	$\sum = 40,000,000$

$$\sigma = \sqrt{\frac{40,000,000}{5}} = 2,828.43$$