

Mean from a frequency Table = $\sum \frac{f_x}{n} = \sum \frac{f}{n} x = \sum x P(x)$ ✓

$\uparrow$
 $P(x)$

Pop. St. Standard Deviation (frequency table) = $\sqrt{\frac{\sum f_x^2 - \frac{1}{n}(\sum f_x)^2}{n}}$

$$= \sqrt{\sum \frac{f}{n} x^2 - \frac{(\sum f_x)^2}{n^2}} = \sqrt{\sum \frac{f}{n} x^2 - \left(\sum \frac{f}{n} x\right)^2}$$

$\uparrow$
 $P(x)$

$$= \sqrt{\sum x^2 P(x) - (\sum x P(x))^2}$$

$$= \sqrt{\sum x^2 P(x) - \mu^2}$$

✓

Notation → In the context of probability distributions...

$$\mu = \text{mean} = \sum (x) \cdot P(x) = \overset{\text{AKA}}{\text{Expected value (of } x)} = E(x)$$

$$\sigma^2 = \text{variance} = \text{Var}(x).$$