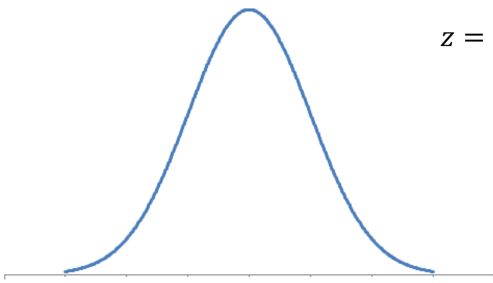
1.4 Sampling Distribution Notation, Definitions, and Formulas

	Sampling Distribution of Sample Proportions	**Sampling Distribution of Sample Means**
Notation	$\bar{P}$ → random variable of sample proportions from all possible samples of the population p → population proportion, $\bar{p}$ → sample proportion $se(\bar{P})$ → represents the standard error of the *sampling distribution of sample proportions* (standard deviation)	$\bar{X}$ → random variable of sample means from all possible samples of the population μ → population proportion, $\bar{x}$ → sample proportion $se(\bar{X})$ → represents the standard error of the *sampling distribution of sample means* (standard deviation)
Central Limit Theorem	The **Central Limit Theorem** isn't about the distribution of individual values from the sample. It is about the sample *proportions* or sample *means* of many different random samples drawn from the same population.	
	For any population proportion p, the sampling distribution of $\bar{P}$ is **approximately normal if the sample size n is sufficiently large**.	For any population mean μ, the sampling distribution of $\bar{X}$ is **approximately normal if the sample size n is sufficiently large**.*
Criteria for Assuming Normality	$np \geq 5$ $n(1-p) \geq 5$ Both of the above criteria must be met.	n > 30 ***Note:*** When the population is known to be normally distributed, the sampling distribution of sample means is normally distributed for any size n.
Expected Value	$E(\bar{P}) = p$	$E(\bar{X}) = \mu$
Standard Error	$se(\bar{P}) = \sqrt{\frac{p(1-p)}{n}}$	$se(\bar{X}) = \frac{\sigma}{\sqrt{n}}$
Z, standard normal value (means when σ is known)	$z = \frac{\bar{p} - p}{\sqrt{\frac{p(1-p)}{n}}}$	$z = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}}$

1.5 Individual Data Values Vs. Sample Means and Proportions

Standard Normal Probabilities with Individual Data Values

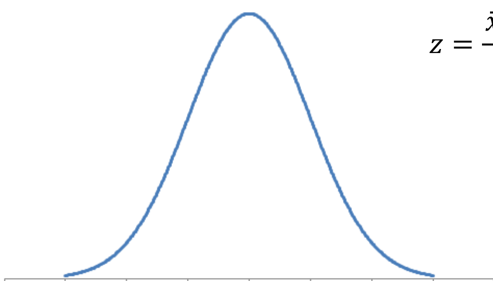
$$z = \frac{x - \mu}{\sigma}$$



$-1 * \sigma$ $\quad \mu \quad$ $+1 * \sigma$

Standard Normal Probabilities with Sample Means

$$z = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}}$$

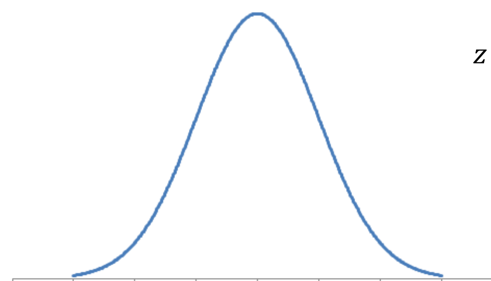


$-1 * \frac{\sigma}{\sqrt{n}}$ $\quad E(\bar{X}) \quad$ $+1 * \frac{\sigma}{\sqrt{n}}$

$$E(\bar{X}) = \mu$$

Standard Normal Probabilities with Sample Proportions

$$z = \frac{\bar{p} - p}{\sqrt{\frac{p(1-p)}{n}}}$$



$-1 * \sqrt{\frac{p(1-p)}{n}}$ $\quad E(\bar{P}) \quad$ $+1 * \sqrt{\frac{p(1-p)}{n}}$

$$E(\bar{P}) = p$$