**Confidence Intervals for AP Statistics**

**Proportions**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Statistic** | **Parameter** | **Conditions** | **Formula** | **Calculator** |
| One-sample *z*-interval for a proportion |  |  | * Random sample * *n* ≤ 10%N * and |  | 1-PropZInt |
| Two-sample *z*-interval for a difference in proportions |  |  | * Independent random samples or randomized experiment * *n1* ≤ 10%N1 and *n2* ≤ 10%N2 * , , |  | 2-PropZInt |

**Means**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Statistic** | **Parameter** | **Conditions** | **Formula** | **Calculator** |
| One-sample *t*-interval for a mean  or  paired t-interval |  |  | * Random sample or randomized experiment * *n* ≤ 10%N * Population distribution is normal (given or sample data show no strong skew or outliers) or | df = n – 1 | TInterval |
| Two-sample *t*-interval for a difference in means |  |  | * Independent random samples or randomized experiment * *n1* ≤ 10%N1 and *n2* ≤ 10%N2 * For each sample or group, the population distribution is normal (given or sample data show no strong skew or outliers) or | df = smaller of n1 – 1 and n2 – 1  OR df = use technology | 2-SampTInt |

**Slope**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Statistic** | **Parameter** | **Conditions** | **Formula** | **Calculator** |
| *t*-interval for a slope |  |  | * Relationship between *x* and *y* is fairly linear * *n* ≤ 10%N * For each *x*, the distribution of *y* is normal * For each x, *y* has the same standard deviation * Random sample or randomized experiment | df = n – 2 | LinRegTInt |

**Significance Tests for AP Statistics**

**Proportions**

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| **Name** | **Null Hypothesis** | **Conditions** | **Formula** | **Calculator** |
| One-sample *z*-test for a proportion | H0: p = p0 | * Random sample * *n* ≤ 10%N * and |  | 1-PropZTest |
| Two-sample *z*-test for a difference in proportions | H0: p1 – p2 = 0 | * Independent random samples or randomized experiment * *n1* ≤ 10%N1 and *n2* ≤ 10%N2 * , , |  | 2-PropZTest |

**Means**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Null Hypothesis** | **Conditions** | **Formula** | **Calculator** |
| One-sample *t*-test for a mean  or  paired *t*-test | H0: = | * Random sample or randomized experiment * *n* ≤ 10%N * Population distribution is normal (given or sample data show no strong skew or outliers) or | df = n – 1 | T-Test |
| Two-sample *t*-test for a difference in means | H0: = 0 | * Independent random samples or randomized experiment * *n1* ≤ 10%N1 and *n2* ≤ 10%N2 * For each sample or group, the population distribution is normal (given or sample data show no strong skew or outliers) or | df = smaller of n1 – 1 and n2 – 1  OR df = use technology | 2-SampTTest |

**Slope**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Null Hypothesis** | **Conditions** | **Formula** | **Calculator** |
| *t*-test for a slope | H0: = | * Relationship between *x* and *y* is fairly linear * *n* ≤ 10%N * For each *x*, the distribution of *y* is normal * For each x, *y* has the same standard deviation * Random sample or randomized experiment | df = n – 2 | LinRegTTest |

**Chi-Square**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Hypotheses** | **Conditions** | **Formula** | **Calculator** |
| test for goodness-of-fit | H0: The claimed distribution of (categorical variable) is correct.  Ha: The claimed distribution of (categorical variable) is incorrect. | * Random sample or randomized experiment * *n* ≤ 10%N * All expected counts > 5 | df = # of categories – 1 | GOF-Test |
| test for homogeneity | H0: There is no difference in the distribution of (categorical variable) across populations or treatments.  Ha: There is a difference in the distribution of (categorical variable) across populations or treatments. | * Random samples from each population or randomized experiment * *n* ≤ 10%N * All expected counts > 5 | df = (# of rows – 1) (# of columns – 1) | -Test |
| test for independence | H0: There is no association between two categorical variables in a given population or the two categorical variables are independent.  Ha: Two categorical variables in a population are associated or dependent. | * Random sample or randomized experiment * *n* ≤ 10%N * All expected counts > 5 | df = (# of rows – 1) (# of columns – 1) | -Test |