Formula Card

Key of Variables and Notation

Σ means to sum what follows	$\hat{y}$ = estimate (prediction) of y	t_α= t-score with probability of α to the right
x = data value	μ = population mean	m = margin of error
n = sample size	σ = population standard deviation	p_0= hypothesized proportion
Q_1, Q_2, Q_3 = 1st, 2nd, and 3rd quartiles	p = probability, population proportion, or p-value	μ_0 = hypothesized mean
z_x = z-score for a particular x-value	$\hat{p}$ = sample proportion = x/n, where x = # of successes	se = standard error
s_x = sample standard deviation of all x-values	df = degrees of freedom = n-1	α= significance level

Term	Formula/Notation	Calculator
	Chapter 2	
Histogram, Scatterplot, or Boxplot	-	2nd > StatPlot > 1 > Histogram, Scatterplot or Boxplot > Zoom > 9
Sample Mean	$\bar{x} = \frac{\sum x}{n}$	Stat > Calc > 1-VarStats
Sample Standard Deviation	$s = \sqrt{\frac{\sum(x-\bar{x})^2}{n-1}}$	Stat > Calc > 1-VarStats
Range	*max - min*	-
Interquartile Range (IQR)	*Q3-Q1*	-
Potential Outliers	*Above Q3+1.5*IQR or below Q1-1.5*IQR*	-
Five Number Summary	*(Min, Q1, Med, Q3, Max)*	Stat > Calc > 1-VarStats
z-Score	$z\text{-}score = \frac{observed\ value - mean}{standard\ deviation\ (\sigma, s, \text{or } s.e.)}$	-
	Chapter 3	
Correlation Coefficient		Stat > Calc > 8: LinReg **Turn DiagnosticOn**
Residual	$y - \hat{y}$	-
Regression Line	$\hat{y} = a + bx$	Stat > Calc > 8: LinReg
Slope and y-Intercept	$b = r\left({}^{s_y}/_{s_x}\right)$ and $a = \bar{y} - b\bar{x}$	Stat > Calc > 8: LinReg
	Chapter 4	
Random Integers		Math > PRB > 5; randInt(min, max, # of values)
Margin of Error	$\frac{1}{\sqrt{n}}$ or $\frac{1}{\sqrt{n}} \cdot 100\%$	-
	Chapter 5	
Probability of Event A	$P(A) = \frac{\#\ outcomes\ in\ A}{\#\ outcomes\ total\ in\ Sample\ Space}$	-
Probability of Complement of Event A	$P(A^c) = 1 - P(A)$	-
Addition Rule	$P(A\ or\ B) = P(A) + P(B) - P(A\ \&\ B)$	-
Conditional Probability of Event A, Given Event B	$P(A\|B) = \frac{P(A\ \&\ B)}{P(B)}$	-
Multiplication Rule	$P(A\ \&\ B) = P(A\|B) \cdot P(B)$	-
Multiplication Rule	$P(A\ \&\ B) = P(A) \cdot P(B), if\ A\ and\ B\ are\ independent$	-

Independence Tests	$P(A \,\&\, B) = P(A) \cdot P(B)$ $P(A\|B) = P(A)$ $P(B\|A) = P(B)$	-
	Chapter 6	
Mean of Discrete Probability Distribution	$\mu = \sum x \cdot P(x)$	Stat> Calc> 1-VarStats L1, L2 where L1 is x and L2 is P(X)
Empirical Rule	*68% within 1, 95% within 2, and 99.7% within 3 sigma*	-
Probability, Given z	Table A	2nd > DISTR > normalcdf(min x, max x, mu, sigma or s.e.)
z, Given Probability to left	Table A	2nd > DISTR > invNorm(area to left)
x, Given Probability to left	$x = \mu + z \cdot \sigma$	2nd > DISTR > invNorm(area to left, mu, sigma or s.e.)
Binomial Probability	$P(x) = \frac{n!}{x!(n-x)!} p^x (1-p)^{n-x}$	2nd > DISTR > binompdf(n,p,x)
Binomial Mean	$\mu = np$	-
Binomial Standard Deviation	$\sigma = \sqrt{np(1-p)}$	-
	Chapter 7	
Mean of Sampling Distributions for Proportions	$\mu_{\hat{p}} = p$	-
Standard Error for Proportions	$s.e. = \sqrt{\frac{p(1-p)}{n}}$ or $\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$	-
Mean of Sampling Distribution for Sample Means	$\mu_{\bar{x}} = \mu$	-
Standard Error for Sample Means	$s.e. = \frac{\sigma}{\sqrt{n}}$ or $\frac{s}{\sqrt{n}}$	-
	Chapter 8	
Confidence Interval for Proportions	$\hat{p} \pm z\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$	Stat > Tests > 1-PropZInt
Confidence Interval for Means	$\bar{x} \pm t_\alpha \cdot \frac{s}{\sqrt{n}}$	Stat > Tests > TInterval (or zInterval if σ is known)
Margin of Error for Proportions	$z\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$	-
Margin of Error for Means	$t_\alpha \cdot \frac{s}{\sqrt{n}}$	-
Sample Size for Proportions	$n = \frac{\hat{p}(1-\hat{p})z^2}{m^2}$	-
Sample Size for Means	$n = \frac{\sigma^2 z^2}{m^2}$ or $\frac{s^2 z^2}{m^2}$	-
	Chapter 9	
z-Score for Proportion	$z == \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$	Stat > Tests > 1-PropZTest
t-Score for Mean	$t = \frac{\bar{x}-\mu_0}{s/\sqrt{n}}$	Stat > Tests > T-Test