

MATH 117: Elements of Statistics

SOME USEFUL FORMULAS

CENTRAL LIMIT THEOREM

Mean: $\mu_{\bar{x}} = \mu$ $\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$ $z = \frac{\bar{x} - \mu_{\bar{x}}}{\sigma_{\bar{x}}}$	Proportion: $\mu_{\hat{p}} = p$ $\sigma_{\hat{p}} = \sqrt{\frac{pq}{n}}$ $z = \frac{\hat{p} - \mu_{\hat{p}}}{\sigma_{\hat{p}}}$
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CONFIDENCE INTERVALS

Maximum error estimate (EBM or ME) for μ

I. (for $n \geq 30$) $E = z_c \frac{\sigma}{\sqrt{n}}$; substitute s for σ if $n \geq 30$	II. (for $n < 30$; population normal, σ unknown) $E = t_c \frac{s}{\sqrt{n}}$; d.f. = $n - 1$
III. Sample Size (for μ): $n = \left(\frac{z_c \sigma}{E} \right)^2$	

Maximum error estimate (EBP or ME) for p

I. ($n\hat{p} \geq 5$ and $n\hat{q} \geq 5$) $E = z_c \sqrt{\frac{\hat{p}\hat{q}}{n}}$	II. Sample Size (for p): $n = \hat{p}\hat{q} \left(\frac{z_c}{E} \right)^2$
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HYPOTHESIS TESTING

Z-TEST FOR MEAN $z = \frac{\bar{x} - \mu}{\sigma / \sqrt{n}}$; substitute s for σ if $n \geq 30$	T-TEST FOR MEAN $z = \frac{\bar{x} - \mu}{s / \sqrt{n}}$; d.f. = $n - 1$
Z-TEST FOR PROPORTION $z = \frac{\hat{p} - p}{\sqrt{\frac{pq}{n}}}$	

Add your formulas here:

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CALCULATOR STUFF

UNIT 2: Five-Number Summary (1-Var Stats)

OPTIONAL: Highlight List name and



to Enter data in L1. Then



to clear existing data in the list.



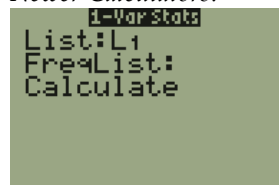
to quit the editor to go to Home Screen.

Older Calculators:

1-Var Stats L1



Newer Calculators:



L1: List name

FreqList: Frequency List [Optional]

Select **Calculate** and Press Enter.

If your data is given as a frequency table, enter data in L1, frequency in L2:

1-Var Stats L1, L2

List: L1

Select **Calculate** and Press Enter.

FreqList: L2

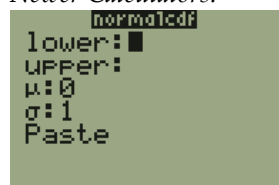
UNIT 4: For Normal Probabilities (Finding areas given z-scores)

Older Calculators:

normalcdf(LeftEnd, RightEnd,
Mean, stdDev)



Newer Calculators:



lower: lower bound

upper: upper bound

μ : mean

σ : Standard Deviation

Select **Paste** and Press Enter button twice.

UNIT 4: For Normal Probabilities (Finding z-scores given areas)

Older Calculators:

invNorm(area-to-left, mean,
StdDev)



Newer Calculators:



area: area to the left











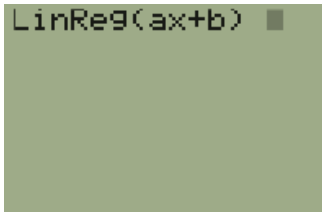

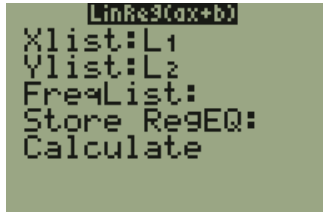
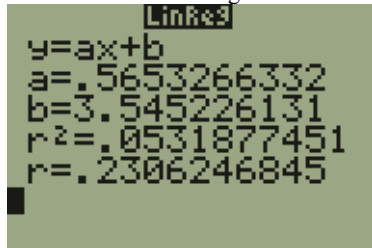


μ : mean

σ : Standard Deviation

Select **Paste** and Press Enter button twice.

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CALCULATOR STUFF

UNIT	TI-CALC FUNCTION	Older Calculators	Newer Calculators	COMMENTS
5: CONFIDENCE INTERVALS	ZINTERVAL	STAT » Tests » 7		<i>Alternate method:</i> STAT, right arrow to TESTS, then down arrow to 7:ZInterval
	TINTERVAL	STAT » Tests » 8		<i>Alternate method:</i> STAT, right arrow to TESTS, then down arrow to 8:TInterval
	1-PROPZINT	STAT » Tests » A		<i>Alternate method:</i> STAT, right arrow to TESTS, then down arrow to A:1-PropZInt
7: HYPOTHESIS TESTING	1-PROPZTEST	STAT » Tests » 5		
7: HYPOTHESIS TESTING	2-PROPZTEST	STAT » Tests » 6		
8: HYPOTHESIS TESTING	T-TEST	STAT » Tests » 2		Also for two sample matched pairs test (dependent samples)
8: HYPOTHESIS TESTING	Z-TEST	STAT » Tests » 1		Choose DATA or Stats
8: HYPOTHESIS TESTING	2-SAMPZTEST	STAT » Tests » 3		
8: HYPOTHESIS TESTING	2-SAMPTTEST	STAT » Tests » 4		
9: CHI-SQUARE TESTS	χ^2 -TEST Independence	STAT » Tests » C		Enter data in Matrix A, then run the test. Matrix B will have Expected Frequencies.
3: LINEAR REGRESSION	LINREG(ax+b)	<p>STAT » Calc » 4</p>  <p>If you press enter at the above screen, you'll run a regression on L1 and L2 data.</p> <p>If you wish to run regression on data stored in another list, say x's in L3 and y's in L2:</p> <p>LinReg(ax + b) L3, L2</p>	  <p>If you wish to run regression on data stored in another list, say x's in L3 and y's in L2, change the XList and YList accordingly.</p> <p>FreqList can be left blank.</p>	<p>If your LinReg result does not include r and r² as shown below then you'll need to turn on the Diagnostic feature.</p>  <p>To Turn Diagnostic On:</p>  <p>until you see:</p>  <p>Press Enter a couple of times until you see DONE on your screen.</p>