To Find z's, x's and Areas (probabilities) for the Normal Distribution

Use these functions instead of using an SND table

On the TI-83 use the functions normalcdf(and invNorm(
On the TI-86 use the functions nmcdf(and invnm(

Where are the functions on the calculator?

- **To access the functions on the TI-83, press 2nd DISTR then 2:normalcdf(or 3:invNorm(**
- **To access the functions on the TI-86, press 2nd MATH MORE then select STAT and then DIST. Then select nmcdf(or invnm(**

AREA BETWEEN x's or z's.

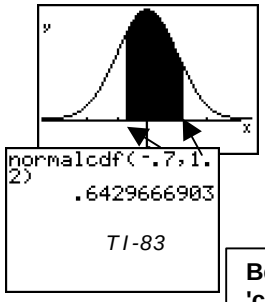
ON BOTH calculators, the area (probability) returned is the area between the *lowerbound* and the *upperbound*. To get the area, you must enter the *bounds*. If the mean and standard deviations are not entered, the calculator assumes $\mu = 0$ and $\sigma = 1$. If you are using x's, you will need to enter the mean and standard deviation (but it saves the trouble of finding the z's). The general form of the function is

normalcdf(*lowerbound*,*upperbound*,μ,σ) or
nmcdf(*lowerbound*,*upperbound*,μ,σ).

Assumed to be $\mu = 0$ *and* $\sigma = 1$ *if not entered*

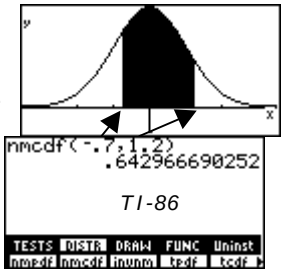
Symbols
μ = the mean
σ = the standard deviation
A = the area (probability)

EXAMPLE) Find the area between $z = -.7$ and $z = 1.2$.
(the graphs are for illustrative purposes only)

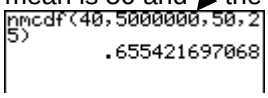


Areas are usually rounded to 4 places (by you)
Calculator answers are ***more*** accurate than book answers

Be sure to use 'cdf and not 'pdf

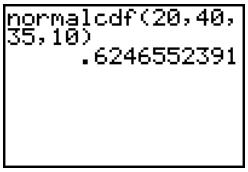


Areas involving infinity. If one of the bounds is infinity, use a large z or x (or large -z or -x) for that z (or x). Use 5000000 or -5000000 if you want to be sure. As an example…
Find the area to the right of x = 40 when the mean is 50 and the standard deviation is 25 .



TI-86 (use normalcdf(on the TI-83)

EXAMPLE) Find the area between $x = 20$ and $x = 40$ when the mean $\mu = 35$ and $\sigma = 10$.



NOTE: On the TI-86, you must install the STAT package to run these. The lab TI-86 has it on it. Or ask your instructor.

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GET the x or z GIVEN an AREA.

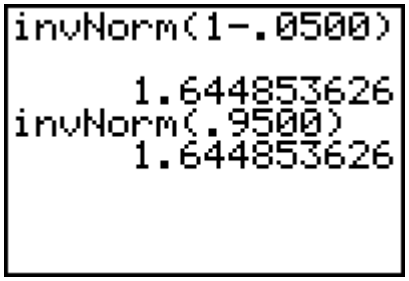
ON BOTH calculators, the z or x returned is the z or x whose area to the left of it have been given. To get the z or x, you must enter the *area to the left of x or z*. If the mean and standard deviations are not entered, the calculator assumes $\mu = 0$ and $\sigma = 1$. If you are looking for an x, you will need to enter the mean and standard deviation (but it saves the trouble of finding the x after finding a z). The general form of the function is

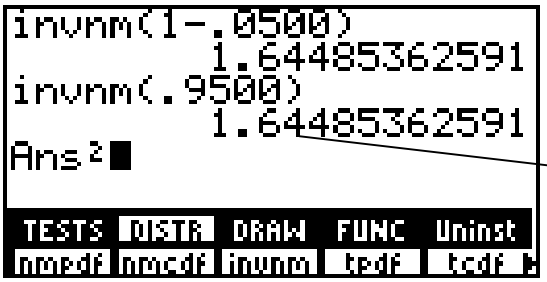
InvNorm(*area*,μ,σ) or invnm(*area*,μ,σ).

Assumed to be $\mu = 0$ *and* $\sigma = 1$ *if not entered*

To find z or x when given an area, always adjust the area so that you give the calculator all of the area to the left of the z or x.

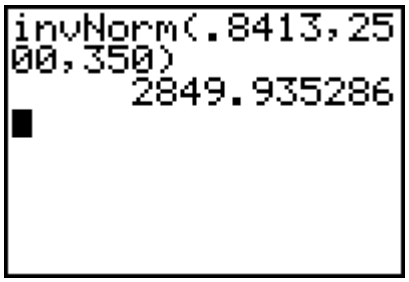
EXAMPLE) Find the z when given the area to the right of z is .0500.
In this case, the area to the left of the z is 1 - .0500. So we either feed the calculator 1-.0500 or .9500.

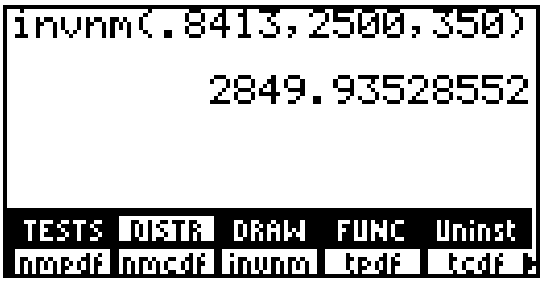




This is a z of about 1.645 or rounded to two places, it is 1.64.

EXAMPLE) Find the x when given the area to the left of x is .8413, the mean is 2500 and the standard deviation is 350.
In this case, we must enter the mean and standard deviation. We do not have to use the formula $x = \mu + z\sigma$ however because the calculator already made the adjustment for us.





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