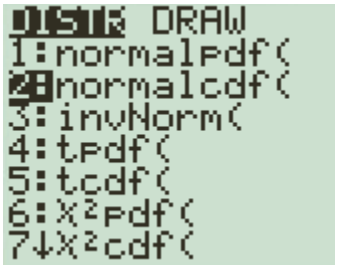
Normal distribution using TI 83: @imathesis.com

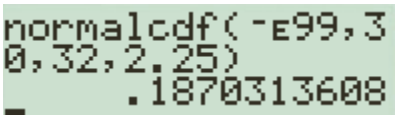
1. Given the population mean, μ = 32; and, the population standard deviation, σ = 2.25, find:
   a) Probability of x < 30.
   b) Probability of x > 35.
   c) Probability of x greater than 30 and less than 35; that is $P_{(30 < x < 35)}$
   d) If we choose 56 values of the random variable at random, and the sample mean is = 33, considering that the population standard deviation is 2.25, what is the probability that samples of the same size are less than 33?
   e) What is the x value that is above 99% of all other values of the variable?

Press 2nd DIST:



a) Probability of x < 30:

You need to remember the Syntax, in the given order: Normalcdf(lower, upper, μ, σ).
Choosing normalcdf:

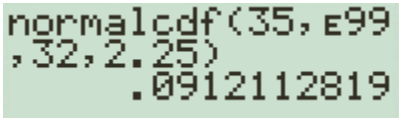


The lower bound is negative infinite, represented by –EE99 (Press the little negative, then 2nd, then the comma key, and then 99). For negative infinite you may also enter -10000 or -99999.

The answer to a) is 0.1870 rounded to four decimal places.

b) Probability of x > 35.

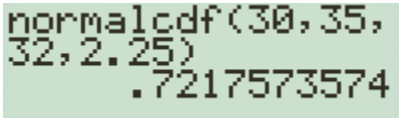
Greater than 35 means that 35 is the lower bound; the upper bound is infinity: E99. As follows:



The answer to b) is 0.0912 rounded to four decimal places.

c) $P_{(30 < x < 35)}$

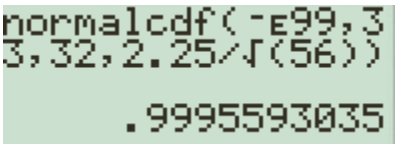
Lower bound is 30, upper bound is 35:



The answer to c) is 0.7218 rounded to four decimal places.

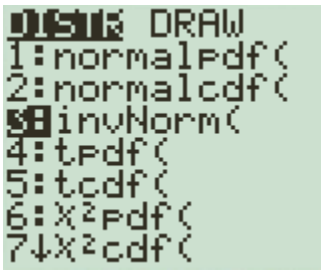
d) For a random sample of the variable x, of size n = 56, the probability that samples of the same size are less than 33:

In this case, the Central limit theorem applies; therefore, we divide the standard deviation by the square root of the sample size. This is a question of less than a value, as follows:

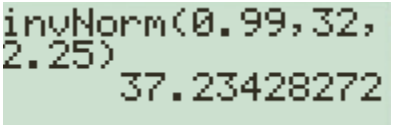


Answer: The probability that samples of size 56 are less than 33, is about 0.9996.

e) The x value that is above 99% of all other values of the variable: In this case we know the probability or area, 0.99; choose Inverse Normal:



The syntax is invNorm(Area, μ, σ):



The answer to d) is the variable x value that is above 99% of the population is x = 37.23, rounding to two decimal places.