Binomial distribution calculations:

1. Calculate probability of the random variable being exactly equal to a value:
   Example: A multiple choice test has 10 questions. Each question has four answer choices. What is the probability that a student, choosing answers at random gets 7 questions correct (exactly 7).

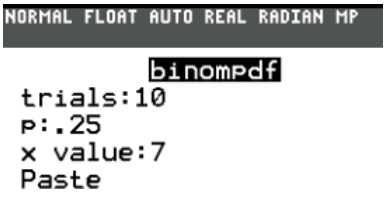
   Formula:

   $P(x) = nCx \cdot p^x \cdot q^{n-x} = 10C7 \cdot p^x(1-p)^{n-x} = 120 \cdot 0.25^7 \cdot 0.75^3 = 0.00309$

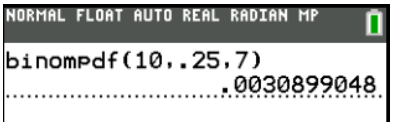
   On the TI 84:

   2nd distr, select binompdf (

   Enter n, p and x:



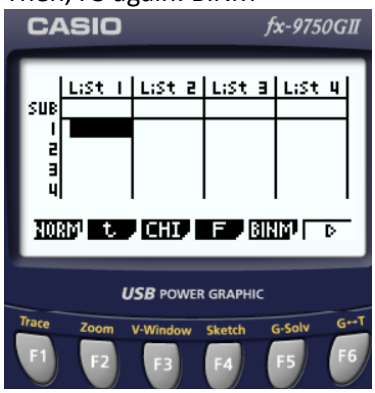
   Hit enter, and enter, and enter again. This is the answer:



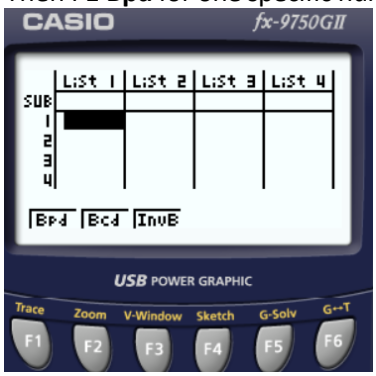
Casio fx- 9750

STAT MENU, hit F5: DIST

Then, F5 again: BINM



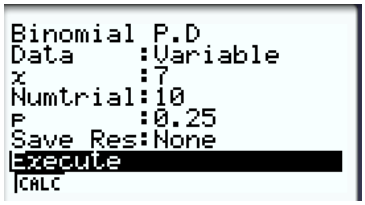
Then F1 **Bpd** for one specific number of successes:



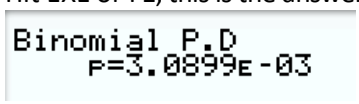
This is the **example** we are working on:

Example: A multiple choice test has 10 questions. Each question has four answer choices. What is the probability that a student, choosing answers at random gets 7 questions correct.

On the binomial distribution screen. Enter: x =7 (number of successes sought), n=10 (total number of trials) and p=1/4 = 0.25 (probability of success):



Hit EXE or F1, this is the answer:



Binomial cumulative probability distribution, --in TI calculators binomcdf, for Casio calculators Bcd, calculates the probability for each specific value of the random variable from zero to x and add them up. It answers the question probability of at most x or probability of less than x number of successes.
Therefore, binom cdf function when x =3, the result is the sum of the binom pdf of 0, 1, 2 and 3. This is the same as "*at most 3 successes*" or "*less than 4 successes*".

Binom cdf Example: A multiple choice test has 10 questions. Each question has four answer choices. What is the probability that a student, choosing answers at random has at most 4 questions correct?
Here $n = 10, p = 1/4 \; or \; 0.25, \; x = 4.$

CDF simplifies calculation for the "*at least x*" type of question:
P (at least 3 successes) = 1 - P (at most 2)
P(at least one) = 1 - P (no successes or zero)

In general:
P (at least x successes) = 1 - P (at most x minus 1 successes)

TI 84:

DISTR DRAW
8↑χ²cdf(
9:Fpdf(
0:Fcdf(
A:binompdf(
B:binomcdf(
C:poissonpdf(
D:poissoncdf(
E:geometpdf(
F:geometcdf(

Casio fx 9750: select F2, for Bcd