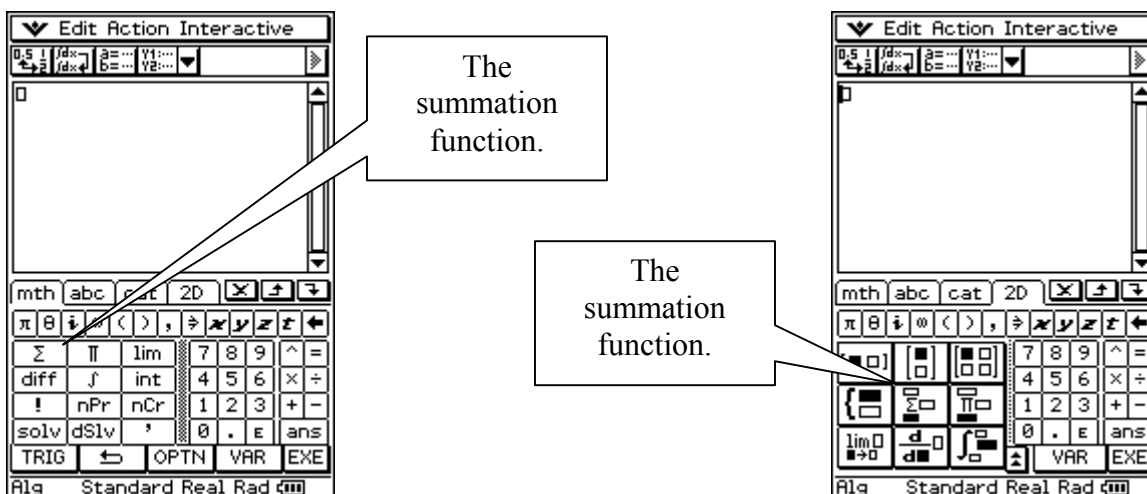
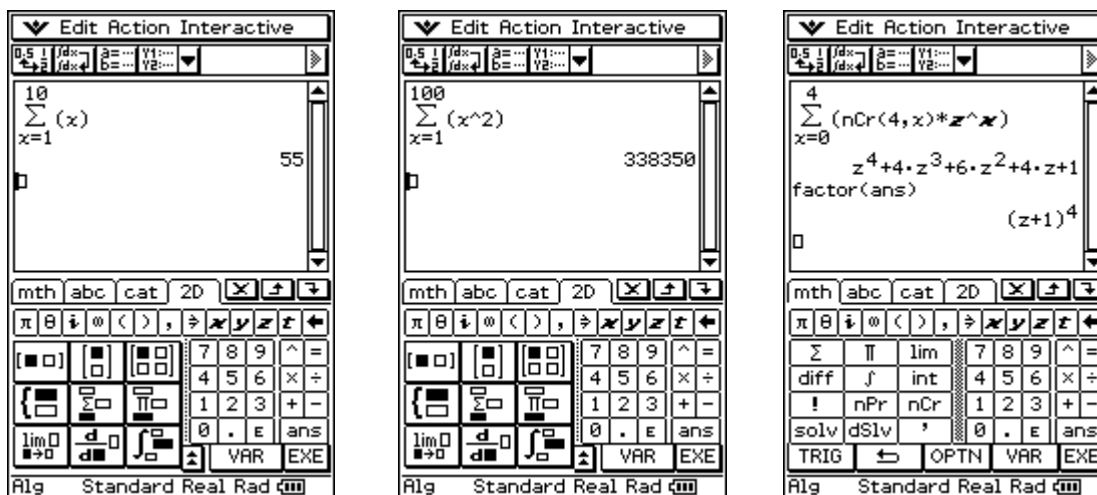


Recall that if a_1, a_2, \dots, a_{12} are real numbers, then $\sum_{k=3}^8 a_k = a_3 + a_4 + a_5 + a_6 + a_7 + a_8$. [We deliberately left out some of the a_i .] In this example, the index of summation is k , the lower limit is 3, and the upper limit is 8. Your ClassPad has a built-in summing function that can evaluate sums for you. You can find it in the mth-CALC menu as shown in the screen capture at the left below and, more conveniently, in the 2D menu as shown in the screen capture at the right below.

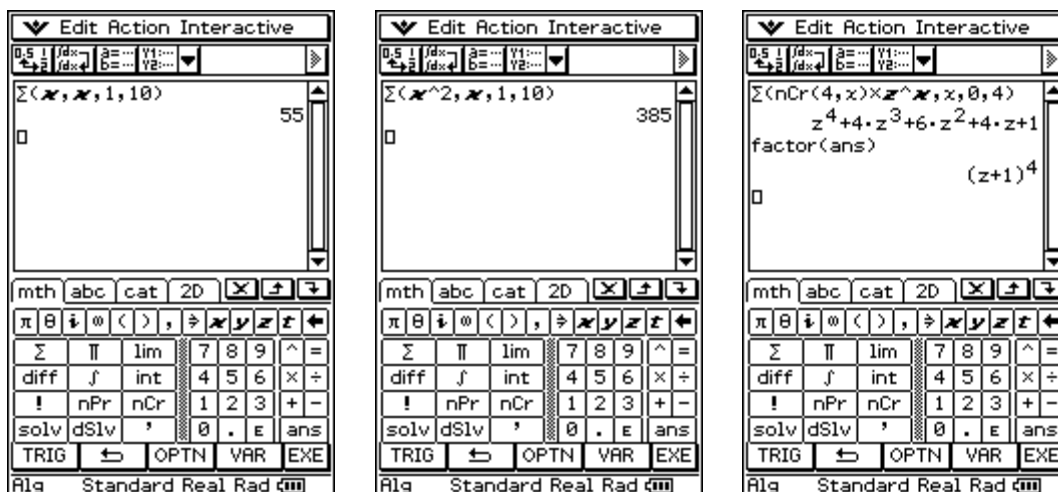


If you use the 2D menu, you tap the button for the summation function and you get a template for the summation. You fill in the index of summation and upper and lower limits and then press EXE to get the value of the sum. Three examples are shown in the screen captures below. Note that for convenience, we use x as the index of summation. Note that the rightmost screen capture illustrates The Binomial Theorem applied to $(1+z)^4$.



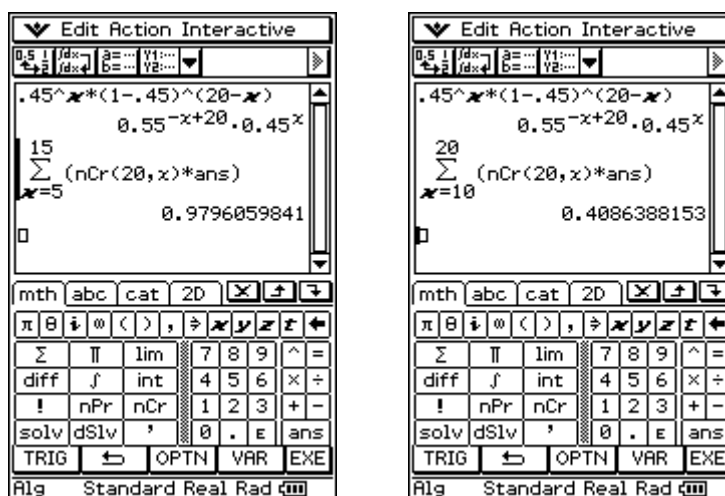
You do have to be careful to use the right parenthesis that is provided on the screen when you tap the icon as the closing right parenthesis in the expression you wish to sum.

The next three screen captures show how the same three calculations would be done using the Σ function that you find in the mat-CALC menu or in the Action-Calculation menu. You can see that this form of the function takes up less room on the screen. Again, you have to be careful to use the right parenthesis supplied when you tap the icon as the closing right parenthesis in the expression you wish to sum.



For us, one of the most helpful applications of the summation function is to sum the probabilities that appear in a binomial probability distribution. Two examples are given below.

Example I: A coin lands HEADs with probability 0.45. If the coin is tossed 20 times, (i) what is the probability that the number of HEADs obtained will be between 5 and 15, inclusive, and (ii) what is the probability that the number of heads will be 10 or more? The solution is shown in the two screen captures below. Note that we used two steps to build the expression we needed to sum. This is useful when the expression you want to sum is too long to fit on the screen. Note also that we used the “fraction to decimal” button to evaluate the sum since we wanted a decimal answer.



Example II: An unprepared student takes a multiple choice test with 12 problems, each of which has 4 answers. If the student guesses randomly on each question, what is the probability that the student will answer 9 or more problems correctly? HINT: The probability of success is 0.25 in this problem. [Answer: 0.0003916621208]

Here is a final problem that is best solved by using the summation function.

Example III: There are 15 students in a French class, 8 men and 7 women. Each week 7 different students are called on to recite using a random procedure. What is the probability that, during a given week, at least 4 of the students who are called on to recite will be men? [NOTE: To solve this problem you need to evaluate the sum

$$\sum_{m=4}^7 \frac{C(8,m)C(7,7-m)}{C(15,7)}$$

The value of this sum is $766/1287 = 0.5951825952$.]