



Usability Test: TI-89 vs. HP 50g



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The Usability Test shows that the TI-89 is far superior to the HP 50g graphing calculator. While the tasks of a HP 50g required sifting through awkward menus, the TI-89 performed the same tasks with fewer buttons and less time.

English 317 Technical Writing

Assignment #6

Introduction. This Usability Test was conducted between a sleek TI-89 Titanium Calculator and a cumbersome, aging HP 50g Graphing Calculator. These calculators are specifically called graphing calculators which mean they are capable of plotting and displaying functions, evaluating simultaneous functions, and reusing functions. These calculators were tested on which is more user-friendly and efficient. Customers interested in this test are college students, preferably with a major in science, mathematics, or engineering. Testing the usability of these calculators is especially important for these customers because using cumbersome equipment boost the probability of error for inputting complex functions.

Methods. These calculators were tested on their ability to input certain math functions. Although these calculators are capable of being programmed and other complex functions, these calculators are being tested on their simpler functions that will be used more frequently and are more fundamental for competent graphing calculator. All tests were conducted at my desk in a typically homework environment during Sunday. I performed the task on the TI-89 and then the HP 50g.

Task 1:

Graph $y=x^2+4$

-find y-intercept

-find max/min

Description: Graphing a function and then finding the curves y-intercept and max/min (min in this case). This command is fundamental because it tests how the calculator handles a simple function. Graphing and finding points on this function is important especially for problems in calculus for quadratic equations and in physics when describing projectile motion.

Task 2:

Graph $y=\sin(x/3)$

-find y-intercept

-find max/min

Description: This task is just like the task before but the user will have to switch units from generic x and y to x and radians. The ability for a calculator to do this easily is necessary because if a problem requires changing units or scale, the user can do so without irritation especially for trigonometric functions which don't fit well in an x-y plot.

Task 3:

-solve $4 \cdot 7/3 - 5 \cdot 9 \cdot 4^{1/2}$

Description: This task tests the most basic calculator function: arithmetic. If a calculator can't perform this function correctly then its ability to compute more complex problems is compromised. A task such as this requires the user to use parentheses, which tell the calculator which numbers to calculate first. Mismatching parentheses is a severe plight for anyone calculating a complex equation.

Task 4:

-find the determinant of $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$

Description: This task tests the calculator's usability with linear algebra problems. The task requires the user to plug in a matrix and tell it to find the determinant which is a fundamental skill in upper division mathematics especially for problems with multiple variables or unknowns.

Task 5:

-redo $4 \cdot 7/3 - 5 \cdot 9 \cdot 4^{1/2}$

-Ans.*2

-Ans.^2+1

Description: This test evaluates the calculator's ability to take results from a past problem and add simple changes. The test will also evaluate how fast the results can be replicated. This function allows the user to make slight changes in case a recent problem was changed without retyping the entire problem which removes the opportunity for typing errors.

Results/Discussion.

Task 1 Results:

TI-89-The command was convoluted. First, I needed to find the $y=$ menu and input the equation, then exit that menu and scroll down over multiple icons to get to the graphing option. Once that menu was reached, the plot appeared by itself. For finding the y -intercept and min, there was a tab labeled MATH that needs to be selected in order to complete this function. Opening the menu was easy and finding the points took less than 5 seconds. Overall, the entire task took 40 seconds. The one notable complaint would be the touchiness of the keys.

HP 50g-The option to graph was easy to find because the option to graph was a button labeled GRAPH. Once the function was inputted and the enter button was hit, it graphed itself. However, I had a lot of trouble finding y -intercept and min function, I found the y -intercept button after a minute but gave up trying to find the min function after five minutes.

Task 2 Results:

TI-89-The switching to radians option was super easy. There is a button in the top right corner labeled MODE that changes the units. The task took a grand total of 4 button presses. This task was very simple. Repeating the y -intercept function and min function were still straightforward.

HP 50g-It was impossible to find the option. The most troublesome part of finding the radians option was that the menus would open up and would have options such as EXPF, GDFP, FRMT none of which I recognized.

Task 3 Results:

TI 89-This task was one button press for each character plus the enter bar. No problems experienced.

HP 50g-The task was performed without any complications. Just as many button presses as there were characters plus the enter button

Task 4 Results:

TI-89- Finding the determinant took several minutes to find but there is a button labeled CATALOG which contained the determinant option as well every math operation from log to sum to trig functions. Having all the functions in one spot is convenient except for the fact that the calculator can't scroll through them and you have to

tap through everything. The task was completed without hitch once the determinant function was found.

HP 50g- The determinant function was also difficult to find but there was a problem in that I could input the numbers correctly. Typically in computer language and programs familiar to engineering college students, putting a space semicolon between the numbers was enough but that didn't work. Putting parentheses around each number was the right format which is very random because that is not the typical situation to use parentheses.

Task 5 Results:

TI-89- Redoing the tasks was the most fun part. The screen allows you to select equations you've already calculated and change things in them. Also it remembers the last thirty commands so after a while my use of the buttons dramatically reduced allowing my calculation to be further streamlined.

HP 50g- The calculator could perform the task but it could only select the last 10 commands and you had to select the equation and then type in ANS=...before anything else. This action is extremely redundant because I already know what the equation previously equaled.

Recommendations.

Testing was remarkably one sided, the TI-89 was easier. Since I had already been acquainted with the TI-89 for sometime, I chose simple tasks that one should be able to figure out within minutes on any calculator in order to even out the test. However, the HP 50g is very disorganized and the labels are compressed into terms that are difficult to recognize. It should also be noted that the typing on the TI-89 is also much clearer and less vulnerable to glare which is always very nice. I wasn't in a particular bright area and I felt like I had to shifting the HP 50g screen read anything.