HOW TO USE YOUR CALCULATOR (What are all those buttons for any way?)

For this class, you will explore the basic functionality of your scientific calculator. Learning to use your calculator efficiently and to a fuller extent will require some time, practice, and patience on your part. Becoming familiar with your calculator will give you more confidence in the problem solving process. It will also help you feel comfortable about using an unfamiliar calculator, since most calculators work very similar.

This handout assumes that you are also comfortable working with numbers in general, order of operations, and manipulating algebraic expressions.

BRIEF REVIEW OF NUMBERS

Real numbers are a set of numbers that includes the integers, fractions, and irrational numbers. You should know the following processes:

Communicative property: $A + B = B + A$ and $A \times B = B \times A$. you should also know that the multiplication statement can be written as $(AB)=(BA)$, $A \cdot B = B \cdot A$, or simply $AB=BA$.

Associative property: $(A + B) + C = A + (B + C)$ and $(A \times B) \times C = A \times (B \times C)$

Inverse property: $A + - A = 0$, $A \times (1/A) = 1$- this is the same as $A \times A^{-1}$, and A/A.

Identity: $A + 0 = A$, $A \times 1 = A$

Distributive: $A \times (B + C) = (A \times B) + (A \times C)$. This can also be written as $A(B+C) = AB + AC$

Order of operations: Follow the rule, "Please excuse my dear aunt sally". This stands for the order of operations to be followed in a mathematical expression: parentheses, exponentiation, multiplication or division, addition or subtraction. Therefore, $3+2 \times 6=?$ Do multiplication before addition. So $12 + 3 = 15$.

WHAT KIND OF CALCULATOR DO YOU HAVE?

We don't mean brand here! Enter the following exactly as written into your calculator: $3 + 2 \cdot 5$. What did you get? You should have gotten 13. If you did not get 13, get another calculator-yours will not work for chemistry. Go to Staples, or Office Depot, or a second hand store and get a new calculator. If you have a graphing calculator, put it in a drawer and lock the drawer for the semester. You will not be allowed to use it on exams. Get used to using the calculator that you will

use for exams. Exam day is not the day to learn how to use an unfamiliar calculator.

WHAT BRAND OF CALCULATOR DO YOU HAVE? YOU CAN USE ANY KIND OF SCIENTIFIC CALCULATOR FOR THIS CLASS. It is also helpful if you can pair up with other students that have a calculator similar to yours. Again, no programmable calculators will be allowed on exams, so find some folks who are good with their calculator and buy them cookies.

PUT YOUR CALCULATOR IN THE CORRECT MODE:

Find the DRG button and press it. your calculator might be different. You might have to press the mode button and choose normal. WHAT DID YOU DO?

FIND YOUR SHIFT BUTTON:

Your calculator buttons have two functions attached to them. the main ones are written on the buttons, while the secondary function is written above the button in another color. The shift button allows you to access the secondary function. **DID YOU FIND YOUR SHIFT BUTTON?**

FIND THE FIX BUTTON AND SET YOUR CALCULATOR TO FLOATING (NORMAL)

FIND THE OPERATIONS LISTED ABOVE ON YOUR CALCULATOR.

Do you have them as written in the table? Put a check mark by that symbol. Is yours different?

Write the symbol for the operation as it appears on your calculator in the table if it is different. If it is the same, put same.(20 points)

operation	Your calculator	What it means
+		Plus or addition
-		Minus, subtraction, note: there is a different key that we use to make a positive number into a negative number. It could be marked +⇆—, or (-)
•, *, x		Multiply, times
/,÷		Over, divided by, division
^, y^x		Raise to the power of or Y raised to the x-power (2^4)
x↱√		Y to the 1/x power (the arrow shows the location of the x, I could not get my computer to write it.)
X^2		X squared
Sqrt, √		Square root, some calculators also have cube roots.
()		Parentheses.
Store, sto		Put a number in memory
Recall, rcl		Get a number out of memory
1/x, X^{-1}		Divided by x, reciprocal of x
EXP, EE, $x10^n$		The scientific button. It is all powerful and does not like to be misused
π		Pi button, don't use 3.14
LOG		Logarithm button, base 10
10^x		Anti log, no, this is not the scientific button. Some calculators use the ^ button and do not have this function.
%		Percentage button
Flo		Floating decimal (normal)
Sci		Toggles to scientific notation, nice so you don't have to count zeros.
←, back		Backspace, delete by one.

USING SOME COMMON KEYS, THAT ARE OFTEN MISS USED. (8 points)

Taking the square root of a number:

What is the square root of 4? Hopefully you know the answer is 2 even without using the calculator. The question is do I enter the 4 first and then hit the sqrt key, or do you hit the sqrt key first then the number 4. Depending on what your calculator expects you will either get 2 or not. Make sure you know the order of entry your calculator expects you to use. So you will be either asking the question, "I want to take the sqrt of 4', [in this case hit the button first then 4] or "I have the number 4, and I need the sqrt." [in this case, enter 4 then hit the button]. **WHAT DID YOU DO TO GET THE SQRT OF 4?**

Taking the power of a number: does your calculator raise the first number to the power of the second number, or the second number to the power of the first? 2^3 should give you 8 as an answer. There are two methods. Some times there is a ^ button. 2^3 should = 8. If you have Y^x, you need to recognize which is y, and which value is x. press 2 then $\boxed{Y^x}$ then 3. If you get 8 then you took the 3rd power of 2, if you got 9, then you took the 2nd power of 3. **WHAT DID YOU DO TO GET THE VALUE '8'?**

Finding any other rooted power: some basic math: $.\sqrt[6]{15625}$ **WHAT KEYS SHOULD YOU PRESS TO SOLVE THIS PROBLEM?**

Log and anti log: again we have to wonder about order of entry. Do you press the log button, then enter the number, or enter the number then press the log button? Find the log 3. **WHAT DID YOU DO TO GET THE VALUE OF 0.477121255? Now take the anti-log of 0.477121255- you should get 3. On most calculators, you have to use your shift key. DID YOU? WHAT DID YOU DO TO GET THE VALUE '3'?**

<u>Interconvert between non-exponential mode and scientific mode:</u> It is often convenient to toggle between scientific and floating modes. I know how my calculators (named Criko, Clowny, and Calculon), work. I would press the shift button and the number 4 to toggle from scientific to floating and the shift button and number 5 to toggle from floating to scientific. **WHAT DO YOU DO TO TOGGLE BETWEEN FLOATING AND SCIENTIFIC? (Sadly, some calculators don't have this function!)**

STOP! TURN IN THIS PART OF THE HANDOUT TO ME. THE ANSWERS TO THE PROBLEMS BELOW GO IN MOODLE

Give the answer to the problems below. (I base your calculator expertise on getting the correct answer, so-no I am not giving you the answers here.)

1. $(-2.0X10^{5})((7.0X10^{-8})$ [2SF]
2. $\frac{(3.8X10^{5})(2.7X10^{9})}{(1.8X10^{7})(4.9X10^{6})}$[2SF]
3. $\frac{(2.3X10^{5})(5.2X10^{-3})}{(7.3X10^{-7})+(6.4X10^{-4})]}$ [2SF]
4. $\frac{(10^{8})(10^{-12})}{(10^{23})(10^{-19})}$ [exponential notation]
5. $3.7X10^{-6}\frac{(10^{22})}{(10^{-38})}$ [2 SF]
6. $2.1x10^{-8}\left({}^{1}/_{10^{-3}}\right)(10^{-9})$[2 SF]
7. $6^{3}+5^{-3}$[3 SF]
8. $\sqrt{81}+\sqrt[4]{124}$ [2SF]
9. log $(7x10^{-3})$ [2 digits]

10. anti log -6.92 [2 SF, scientific notation]

11. $\frac{3^2}{1+\left(\frac{22}{3}+4(-1)^2\right)}$ [2 SF]

12. I went to Macy's to by a shirt. They were having a 50% off sale. The shirt, which was originally marked $40.00, was reduced by 20% then by another 15% before the current sale. Including the new sale price (50% off), how much did the shirt cost? No sales tax!!! [4 SF]

Grading: You can use the handout for scratch paper. Answers on MOODLE do not have you show your work.

Perfect 40 points	Meets expectations 80 % points	Good 70% points	Needs work 60% points	Unacceptable <50% points
All of above is completed with clarity, neatness, and attention to detail. Calculations and answers were correct. Answers were complete and reasonable.	All of above is completed, but could be neater. Calculations and answers correct. Answers were reasonable, but complete sentences, syntax, grammar, or spelling was off.	Was neatly filled out, but parts were left undone. Calculations and answers sort of correct. Answers were somewhat reasonable, but complete sentences, syntax, grammar, and or spelling was off.	Good effort, more incorrect than correct. Major ports were left undone. Calculations and answers were missing and there were major math errors. Answers were okay, but complete sentences, syntax, grammar, and spelling was off.	Handout was poorly executed. Lacks attention to detail. The student did not put the time necessary to complete HO. Messy, calculations and answers were more incorrect than correct, or missing... Major ports were left undone.