

Algebra 1 – Summer Assignment:

While everyone needs and deserves a break from school to relax and recharge, I want to make sure that each student is set up for success in Algebra 1.

The following is the summer requirement for Algebra 1:

Purchase a graphing calculator: TI-84 Plus (or) TI-84 Plus CE

This will be a personal investment as these calculators are not cheap; however, a one-time purchase of a TI-84 Plus (or Plus CE) in middle school will take a student through all the math courses they need to take in high school, college and beyond– including algebra, geometry, calculus and statistics.

What's the difference between the Plus and Plus CE? The Plus CE is a newer model, a bit more expensive, has more memory, lighter, slimmer, has color image capability BUT it functions the same as the Plus. These new features are not a necessity.

****These calculators can be found at Office Depot and on Amazon. If there is a concern about the cost of these calculators (avg. for the Plus: \$113; the Plus CE: \$135) – please email your concerns to me directly.***

ASSIGNMENT: 1) HAVE PATIENCE. 2) following below you will find templates, reference guides and practice sheets to show you how to use a graphing calculator. Graphing calculators are more complicated to use and it will take some time understanding how they work. Use the packet as a guide; **ALSO...be resourceful!** There are A LOT of **YouTube** videos that show how to use the calculator as well. If you have an older sibling or parent who has used these extensively, ask them to show you as well. It will take some time and patience!!

GOAL: Start the first day of school knowing how to use a graphing calculator entering simple math problems. As the year goes on and with each new chapter, we will spend time making sure we are using the calculator correctly. I do not expect you to know how to use every function on the calculator – there are a lot of functions; again, WE WILL NOT be using all of these functions – just the ones related to Algebra. ***Stick to the packet and you'll be fine!***

The packet IS NOT DUE - it is a packet to help you learn how to use the calculator.

ENJOY YOUR SUMMER!!

Name: _____

Graphing Calculator Basics

The calculators you use today are *not just any old calculator* – they are **graphing calculators**. They can do much more for you than just simple math. This lesson will teach you many of the great ways your graphing calculator can support you.

A. EXPONENTS

- An **exponent** is a raised symbol beside a number such as 2^4 meaning $2 * 2 * 2 * 2$.
- In order to solve a problem including **exponents** using your graphing calculator, use the **^** key located on the right side of the calculator.
- TRY IT YOURSELF!** Solve the following problems involving **exponents** using your calculator:
(As always, be careful with parenthesis!)

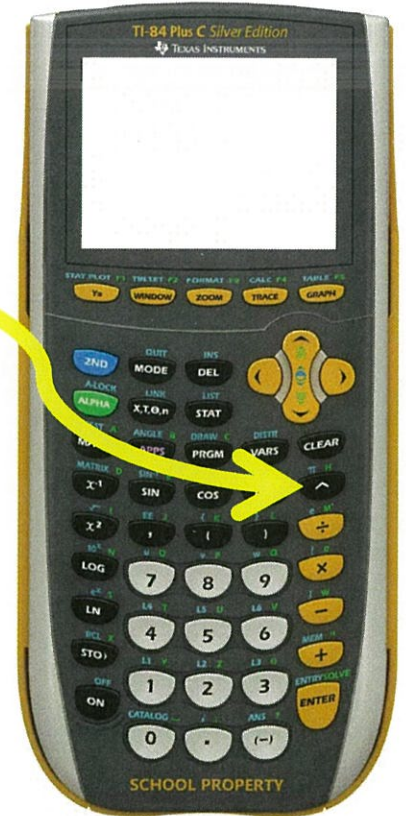
i. $4^2 =$ _____

ii. $(-18)^6 =$ _____

iii. $23^4 =$ _____

iv. $2^{14} * 3^3 =$ _____

v. $7^8 + 9^2 =$ _____



B. SQUARE ROOTS

- a. The **square root** of a number is a number that produces a certain quantity when multiplied by itself.

Example: $\sqrt{16} = \pm 4$ because

$$4 * 4 = 16 \text{ and } (-4) * (-4) = 16.$$

- b. In order to solve a problem including **square roots** using your graphing calculator, use the blue **2ND** key located on the left side of the calculator followed by the $\sqrt{\quad}$ key shared with the x^2 key.

Any operations written in **BLUE** behind the buttons on the calculator can always be used by first using the blue **2ND** key.

- c. **TRY IT YOURSELF!** Solve the following problems involving **square roots** using your calculator:
(As always, be careful with parenthesis!)

i. $\sqrt{100} = \underline{\hspace{2cm}}$

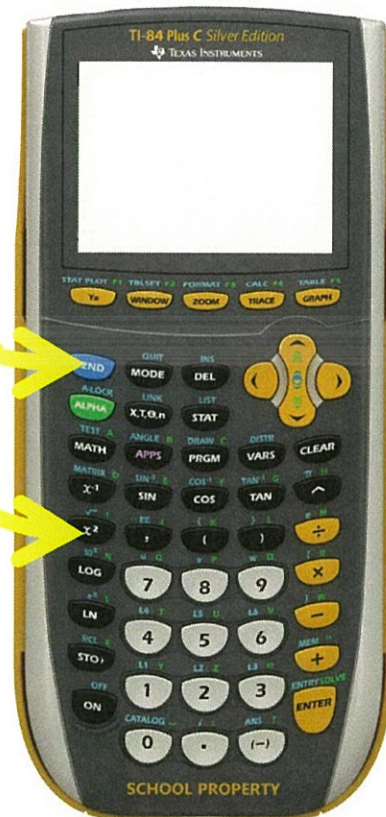
ii. $\sqrt{85} = \underline{\hspace{2cm}}$

iii. $\sqrt{256} * \sqrt{4} = \underline{\hspace{2cm}}$

iv. $\sqrt{9025} * 6 = \underline{\hspace{2cm}}$

v. $\sqrt{81} + 16 = \underline{\hspace{2cm}}$

vi. $\sqrt{-9} = \underline{\hspace{2cm}}$



C. FRACTIONS

- a. A **fraction** is a number written in the form $\frac{a}{b}$ or a/b .

Examples: $\frac{6}{5}$ and $9/10$.

- b. In order to solve a problem including **fractions** using your graphing calculator, use the **MATH** key located on the left side of the calculator. Then, in the **calculator window** scroll right → to the **FRAC** heading.

Finally, scroll down ↓ to the selection n/d .

- c. **TRY IT YOURSELF!** Solve the following problems involving **fractions** by simplifying using your calculator when possible:

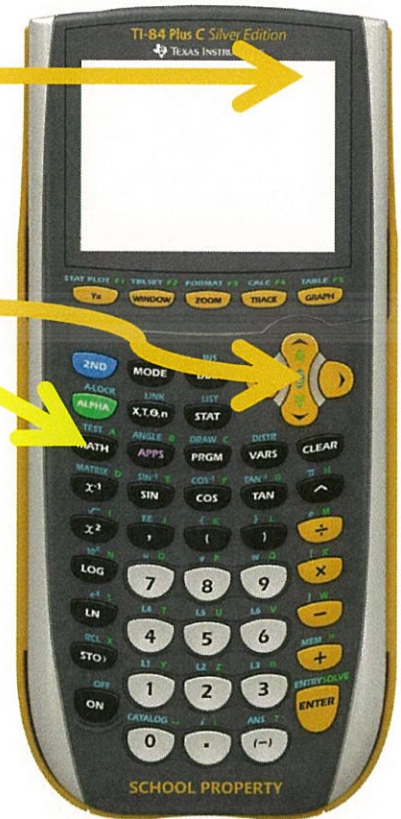
i. $852/2 = \underline{\hspace{2cm}}$

ii. $-\frac{4887}{250} = \underline{\hspace{2cm}}$

iii. $\frac{-2323}{-3} = \underline{\hspace{2cm}}$

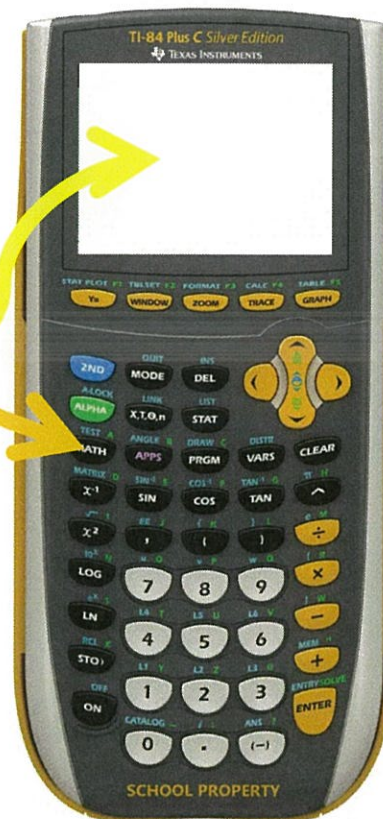
iv. $\frac{550}{15} + 84 = \underline{\hspace{2cm}}$

v. $\frac{777}{11} - \frac{54}{6} = \underline{\hspace{2cm}}$



D. CONVERTING A NUMBER TO A FRACTION

- a. Again, a number written using **fractions** looks like $\frac{6}{7}$ or $5/10$. Sometimes, you have a number and would like to know its **fraction** equivalent.
- b. In order to convert a number to a **fraction** using your graphing calculator, use the **MATH** key located on the left side of the calculator. Then, in the **calculator window** select **>FRAC**.
- c. *TRY IT YOURSELF!* Write the following numbers in their equivalent **fraction** form using your calculator:
(As always, be careful with parenthesis!)
- $7.5 =$ _____
 - $-6.777 =$ _____
 - $-10.05 =$ _____
 - $99.34 + 78.6 =$ _____
 - $6.01 * 9.45 =$ _____



E. CONVERTING NUMBERS TO DECIMALS

- a. A number written using **decimals** looks like 5.422 or 6.0001. Sometimes, you have a number and would like to know its **decimal** equivalent.
- b. In order to convert a number to a **decimal** using your graphing calculator, use the **MATH** key located on the left side of the calculator.

Then, in the **calculator window** select **>DEC.**

- c. *TRY IT YOURSELF!* Write the following numbers in their equivalent **decimal** form using your calculator:
(As always, be careful with parenthesis!)

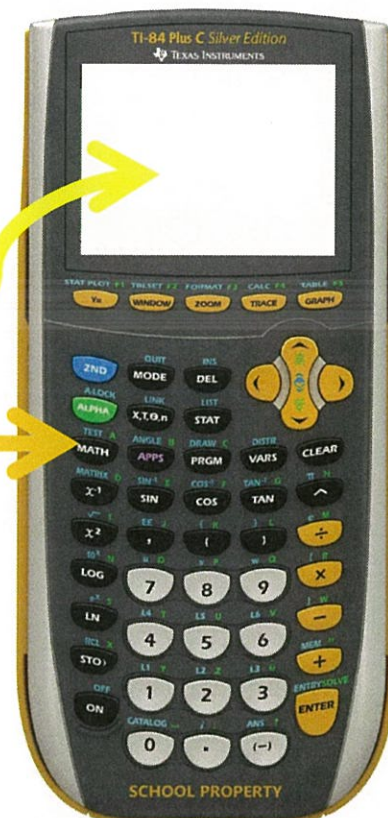
i. $\frac{843}{6} = \underline{\hspace{2cm}}$

ii. $-\frac{486963}{1000} = \underline{\hspace{2cm}}$

iii. $\frac{-10}{-9} = \underline{\hspace{2cm}}$

iv. $\frac{55}{15} + 764 = \underline{\hspace{2cm}}$

v. $\frac{77}{19} - \frac{59}{6} = \underline{\hspace{2cm}}$



Scavenger Hunt: What can you do with a TI-84 Plus CE Handheld?**Part 1: Getting to Know the Keypad**

Draw arrows from these descriptions to the picture of the TI-84 Plus CE shown at right.

- The most important keys: **on**, **clear**, **2nd**, **alpha** and **enter**
- Math Symbols:
 - Multiplication
 - Division
 - Addition
 - Subtraction
 - Exponent \square^{\square}
 - Pi
 - Negative numbers $\square(-)$ (note: this is NOT the subtraction key!)
- Other useful symbols
 - Comma $\square,$
 - Delete **DEL**
 - Space \square
 - Squaring a number \square^2
 - Parentheses $\square(\square)\square$
- Which key do you push to access the **light blue** functions on the key pad? _____
- Which key do you push to access the **green** functions on the key pad? _____
- How do you turn the calculator off?

**Now turn on your TI-84 Plus CE.**

- Press **on** to turn on the handheld.
- Check the battery icon in the upper right of your screen. If you are below 25%, please charge your batteries immediately. (TI-84 Plus CE's have rechargeable Lithium ion batteries; older models the use AAA batteries don't have the battery icon).
- Press **2nd mode** to "quit" out of whatever is open and go to a blank calculator screen.

	Battery is 75% to 100% charged.
	Battery is 50% to 75% charged.
	Battery is 25% to 50% charged.
	Battery is 5% to 25% charged.
	Battery is charging.

Part 2: Performing Calculations

Do the following problems on your “Calculator” screen.

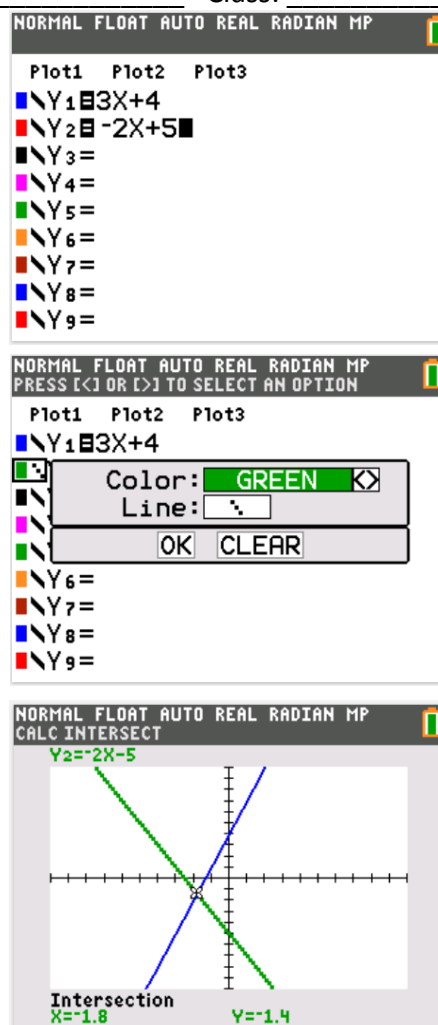
Problem	Your solution	Hints
a. $-12.1 - 15.3$		Did you use the $\boxed{(-)}$ key?
b. $143.72 \text{ times } 8.9$		What does the multiplication symbol look like on the screen?
c. 55^4		How many different ways can you do this?
d. $3^8 - 4^5$		Which key did you use to raise to powers?
e. $\sqrt[3]{64}$		Hint: Press the $\boxed{\text{math}}$ key and look for: $3\sqrt{}$
f. $ -54.2 + 5 \cdot 14.7 $		Hint: Press the $\boxed{\text{math}}$ key, then right-arrow to NUM, and choose abs(. Use the right arrow to get out of the absolute value bars.
g. $\frac{1}{7} + \frac{5}{12}$		Just use the division sign to get a fraction. Did you want a fraction or a decimal for your answer? Press the $\boxed{\text{math}}$ key, then FRAC to get a fraction.
h. $\frac{1+5}{7+5}$		What must you do to get the correct answer of $\frac{1}{2}$?
i. $\frac{1}{7} * \frac{5}{12}$		How can you get it to look like this: $\frac{1}{7}$, not $1/7$, on your screen? Hint: press $\boxed{\text{alpha}} \boxed{y=}$ to get the fraction menu, and choose n/d for a numerator over a denominator.
j. 4.56×10^4		There are three ways to do this, using $\boxed{\wedge}$, using $\boxed{2\text{nd}} \boxed{\log}$ to get $\boxed{10^x}$, or using $\boxed{2\text{nd}} \boxed{,}$ to get $\boxed{\text{EE}}$. Try them all!
k. $(8 + 4) \times (15 - 9)$		What happens if you <i>don't</i> use parentheses?
l. $2\frac{3}{4} + 5\frac{3}{7}$		Hint: press $\boxed{\text{alpha}} \boxed{y=}$ to get the fraction menu, and choose Un/d for a whole number, then a numerator over a denominator, in other words, a mixed number. How else could you do it?



Part 3: Graphing Equations Step-by-Step

- A. Press $\boxed{y=}$ to get the equation entry screen. Key in the equation you want graphed; the equation must be in “y=” form. In the example shown, $y = 3x + 4$ was keyed in as $\boxed{3} \boxed{X,T,\theta,n} \boxed{+} \boxed{4}$ and $y = -2x + 5$ was keyed in as $\boxed{(-)} \boxed{2} \boxed{X,T,\theta,n} \boxed{-} \boxed{5}$. You do not need to key in the implied multiplication sign. Use the $\boxed{X,T,\theta,n}$ variable key for the variable x .
- B. You can change the color or the line style: press the left arrow until you reach the color box at the left of the equation, and then press enter. Use the right and left arrow keys to choose a color. Then press the down arrow, then the right and left arrows, to change the line style. Use the down arrow to get to “OK,” then press enter.
- C. Press the $\boxed{\text{graph}}$ key to view your graphs.
- D. To find the point where the two lines intersect, press $\boxed{2nd} \boxed{\text{trace}} \boxed{5} \text{:intersect} \boxed{\text{enter}} \boxed{\text{enter}} \boxed{\text{enter}}$. You will see the x and y coordinates of the intersection at the bottom of the screen.

Your turn!

Press $\boxed{y=}$ to get back to the equation entry screen and press $\boxed{\text{clear}}$ to delete an existing equation. Practice keying in and graphing a variety of equations. Be sure that you include a variable, x , in each equation. Then answer the following questions.



1. What happens if you forget to include a variable in your equation?	
2. What does your graph look like if you include x^2 in your equation?	
3. What does your graph look like if you include x^3 in your equation?	
4. What does your graph look like if you choose Line:   as your line style?	
5. How many equations can you graph at one time?	
6. What else did you observe as you explored the $y=$ and graphing screens?	