NAME: ____________________________________

Algebra One
Calculator Tutorials
TI 84 Plus

Part One
Unit 1 to Unit 5
# CONTENTS

*Please Note: You must select “Current Page” to avoid printing the entire document.*

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting to Know Your Calculator</td>
<td>2</td>
</tr>
<tr>
<td>Important Keystrokes</td>
<td>3</td>
</tr>
<tr>
<td>Graphing Calculator Scavenger Hunt</td>
<td>4</td>
</tr>
<tr>
<td>Absolute Value, 1.3, Exploring Real Numbers</td>
<td>6</td>
</tr>
<tr>
<td>Fractions to Decimals, 1.3, Exploring Real Numbers</td>
<td>7</td>
</tr>
<tr>
<td>Decimals to Fractions, 1.3, Exploring Real Numbers</td>
<td>8</td>
</tr>
<tr>
<td>Reducing Fractions, 1.3, Exploring Real Numbers</td>
<td>9</td>
</tr>
<tr>
<td>Adding Fractions, 2.1, Adding Rational Numbers</td>
<td>10</td>
</tr>
<tr>
<td>Subtracting Fractions, 2.2, Subtracting Rational Numbers</td>
<td>11</td>
</tr>
<tr>
<td>Multiplying Fractions, 2.3, Multiplying and Dividing Rational Numbers</td>
<td>12</td>
</tr>
<tr>
<td>Dividing Fractions, 2.3, Multiplying and Dividing Rational Numbers</td>
<td>13</td>
</tr>
<tr>
<td>Exponents, 1.2, Exponents and the Order of Operations</td>
<td>14</td>
</tr>
<tr>
<td>Square Roots, 3.8, Finding and Estimating Square Roots</td>
<td>15</td>
</tr>
<tr>
<td>Evaluate Expressions, 2.1, Adding Rational Numbers</td>
<td>16</td>
</tr>
<tr>
<td>Making a Table from a Function Rule, 5.3, Function Rules, Tables, and Graphs</td>
<td>17</td>
</tr>
<tr>
<td>Find the Range Given a Domain, 5.3, Function Rules, Tables, and Graphs</td>
<td>18</td>
</tr>
<tr>
<td>Linear Regression (Finding a Function Rule from a Table), 5.4, Writing a Function Rule</td>
<td>19</td>
</tr>
<tr>
<td>Mean, 1.6, Mean, Median, Mode, and Range</td>
<td>21</td>
</tr>
<tr>
<td>Median, 1.6, Mean, Median, Mode, and Range</td>
<td>23</td>
</tr>
<tr>
<td>Factorial, 12.7, Counting Methods and Permutations</td>
<td>25</td>
</tr>
<tr>
<td>Permutations, 12.7, Counting Methods and Permutations</td>
<td>26</td>
</tr>
<tr>
<td>Combinations, 12.8, Combinations</td>
<td>27</td>
</tr>
</tbody>
</table>
**Getting to Know Your Calculator**

**Important Keys**

- **ON**  
  Turns the calculator on

- **2ND**  
  Accesses the blue features above the keys

- **ENTER**  
  Means =

- **X,T,θ,n**  
  Inserts an X

- **CLEAR**  
  Erases what you typed. Erases the entire screen if pressed twice

- **DEL**  
  Erases the value under the cursor

- **STO>**  
  Stores values to variables

- **^**  
  Tells the calculator the next number is an exponent

- **x^2**  
  Raises a number only to the 2\textsuperscript{nd} power

- **(-)**  
  Indicates a negative number

- **–**  
  Indicates subtraction

- **ALPHA**  
  Accesses the green features above the keys

- **MODE**  
  Formats the way the calculator enters and displays information. The settings should look like this screen unless otherwise instructed
**Important Keystrokes**

- **2ND ON** [OFF] - Turns the calculator off
- **2ND \( X^2 \)** [\( \sqrt{\cdot} \)] – Accesses square root function
- **2ND MODE** [QUIT] - Turns the calculator off
- **2ND DEL** [INS] - Inserts a value before the cursor
- **2ND ENTER** [ENTRY] - Inserts previous problem
- **2ND (-)** [ANS] – Inserts the answer to the previous problem
- **2ND 0** [CATALOG] – Accesses all functions and symbols
- **2ND + 7 1** Restore original factory settings
Graphing Calculator Scavenger Hunt

1.) Press \[ \text{2ND} \quad \text{+} \quad \text{ENTER} \] What is the ID # of your calculator? ________________

2.) For help, what website can you visit? ________________________________

3.) What happens to the screen when you push \[ \text{2ND} \quad \text{↑} \] over and over? \[ \text{2ND} \quad \text{↓} \] over and over? ________________________________

4.) What letter of the alphabet is located above \[ \div \] ? ________________

5.) To get the calculator to solve the following problem \[ 2\left\{3 + 10 / 2 + 6^2 - (4 + 2)\right\}, \] what do you do to get the \{ and \}? ________________________________________________

6.) Use your calculator to answer the following?
   a.) \[ 2 \times 41.587 \]   b.) \[ -17 - 26 \]   c.) \[ 2578 / 4 \]   d.) \[ 369 + 578 \]
   
   ___________  ___________  ___________  ___________

   e.) Now press \[ \text{2ND} \quad \text{ENTER} \] two times. What pops up on your screen? ________________

   f.) Arrow down and change the 4 to 2. What answer did you get? ________________

   g.) How will this feature be helpful? ____________________________________

7.) Press \[ \text{2ND} \quad 0 \] to access the calculator’s catalog. Scroll up, to access symbols. What is the first symbol? ________ What is the last symbol? ________
8.) Press \(2^{\text{ND}} 0\) to access the calculator’s catalog. An \(A\) appears in the top right corner of the screen. This means the calculator is in alphabetical mode. Press \(\) . What is the 5\(^{\text{th}}\) entry in the L’s? _________________

What do these letter stand for? _________________

9.) Enter this problem into the calculator and press \(\text{ENTER}\). \(2.4 \times 3.7 = ____\). Now press \(\text{MODE} \downarrow\) Float \(\Rightarrow\) to 0 and press \(\text{ENTER}\)  

Now press \(2^{\text{ND}} \text{MODE}\) to return to the home screen and press \(2^{\text{ND}} \text{ENTER}\) and the original problem should appear on the screen, now press \(\text{ENTER}\). What appears on the screen? _________________

Think about this number in relation to the answer you got before. What did the calculator do? _________________

Repeat this same process except select 2 under the Float option. Return to the home screen, recall the original problem and press \(\text{ENTER}\). What number appears on the screen? _________________

What did the calculator do this time? _________________

10.) a.) Enter \((-2)^2\) into the calculator, what answer did you get? _________________

b.) Now enter \(-2^2\) into the calculator, what answer did you get this time? ________

c.) Why do you think you got two different answers? _________________
**Absolute Value**

**Problem:** Find $|-14|$

Press **MATH**

Press **→** to select NUM

![Menu of options]

Press **ENTER**

$\text{abs}(-14)$

Press **(-) 1 4 ) ENTER**

$\text{abs}(-14)$

14

**Practice:** Find the absolute value.

1.) $|61|$  
2.) $|-4|$  
3.) $|-297|$
Simplifying Fractions

Fractions $\rightarrow$ Decimals

**Problem:** Convert $\frac{4}{5}$ to a decimal.

Press $\boxed{4} \div \boxed{5} \text{ ENTER}$

$\boxed{4/5} \quad .8$

**Practice:** Convert each fraction to a decimal.

1.) $\frac{3}{8}$ \hspace{2cm} 2.) $\frac{3}{4}$ \hspace{2cm} 3.) $\frac{2}{3}$
Simplifying Fractions

Decimals → Fractions

Problem: Convert 1.4 to a fraction.

Press 1 • 4 MATH

Fraction will be highlighted.

Press ENTER

1.4→Frac

Press ENTER

1.4→Frac 7/5

Practice: Convert each decimal to a fraction.

1.) 0.25  
2.) 0.3  
3.) $0.\overline{3}$
Simplifying Fractions

Reducing Fractions

**Problem:** Reduce $\frac{12}{18}$ to lowest terms.

Press $\begin{array}{c}12 \\ ÷ \\ 18 \end{array}$ MATH

Fraction will be highlighted.

Press ENTER

$\frac{12}{18}$ Frac

Press ENTER

$\frac{12}{18}$ Frac $\frac{2}{3}$

**Practice:** Reduce each fraction to lowest terms.

1.) $\frac{5}{10}$

2.) $\frac{16}{72}$

3.) $\frac{18}{24}$
Adding Fractions

Problem: \( \frac{4}{5} + \frac{7}{8} \)

Press

\[ ( \frac{4}{5} \div \frac{5}{7} ) + \]

\[ ( \frac{7}{8} \div ) \]

ENTER

\( \left( \frac{4}{5} \right) + \left( \frac{7}{8} \right) \)

1.675

Practice: Add.

1.) \( \frac{2}{3} + \frac{4}{7} \)  
2.) \( \frac{3}{8} + \frac{5}{12} \)  
3.) \( \frac{6}{7} + \frac{12}{5} \)
Subtracting Fractions

Problem: \( \frac{4}{5} - \frac{7}{8} \)

Press

\[
\left( \begin{array}{c}
\left( \begin{array}{c}
4
\end{array}
\right)
\end{array}
\right) \div 5
\]

- 

\[
\left( \begin{array}{c}
7
\end{array}
\right) \div 8
\]

ENTER

\[
(4/5)-(7/8) \rightarrow .075
\]

Practice: Subtract.

1.) \( \frac{2}{3} - \frac{4}{7} \) 
2.) \( \frac{3}{8} - \frac{5}{12} \) 
3.) \( \frac{6}{7} - \frac{12}{5} \)
Multiplying Fractions

Problem: \( \frac{4}{5} \times \frac{7}{8} \)

Press

\[
\left( \frac{4}{5} \right) \div \left( \frac{7}{8} \right)
\]

ENTER

\[
\left( \frac{4}{5} \right) \times \left( \frac{7}{8} \right)
\]

Practice: Multiply.

1.) \( \frac{2}{3} \times \frac{4}{7} \)  
2.) \( \frac{3}{8} \times \frac{5}{12} \)  
3.) \( \frac{6}{7} \times \frac{12}{5} \)
Dividing Fractions

Problem: \( \frac{4}{5} \div \frac{7}{8} \)

Press

\[
( \boxed{4} \div \boxed{5} ) \div ( \boxed{7} \div \boxed{8} )
\]

ENTER

\( \frac{4}{5} \div \frac{7}{8} = 0.9142857143 \)

Practice: Divide.

1.) \( \frac{2}{3} \div \frac{4}{7} \)

2.) \( \frac{3}{8} \div \frac{5}{12} \)

3.) \( \frac{6}{7} \div \frac{12}{5} \)
Exponents

Problem: Evaluate $5^2$.

Press $5 \ ^\ ^\ ^\ ^\ 2$ ENTER

$5^2 = 25$

$x^2$ can be used in place of

Only when you have a power of 2!

Practice: Evaluate.

1.) $4^3$  
2.) $(-10)^2$  
3.) $-10^2$
**Square Roots**

**Problem:** Simplify \( \sqrt{121} \).

Press \(\boxed{2ND}\) \(\boxed{x^2}\) \(\boxed{121}\) \(\boxed{)}\) \(\boxed{ENTER}\)

\[
\sqrt{121} = 11
\]

**Practice:** Simplify.

1.) \(\sqrt{169}\)  
2.) \(\sqrt{81}\)  
3.) \(\sqrt{96}\)
Evaluate Expressions

**Problem:** Evaluate $\frac{2x + 5}{x - 4}$ when $x = -7$

Rewrite the problem $\frac{(2(-7) - 5)}{((-7) - 4)}$

You MUST use ( ) around everything on top AND AGAIN around everything on the bottom!!!!!!

Press Numerator

```
( 2 ( - ) 7 ) + 5
\div
```

Press Denominator

```
( ( - ) 7 ) - 4
```

Enter

```
(2(-7)+5)/((-7)-4) \approx 0.8181818182
```

**Practice:**

1.) $5x^4 - 46$ when $x = -2$

2.) $\frac{11 - 3x}{2x}$ when $x = 5$

3.) $\frac{2x}{11 - 43}$ when $x = -1$
Making a Table from a Function Rule

Format Table
Press \[2^{\text{ND}}\] WINDOW

Problem: Make a table for \(f(n) = -2n^2 + 7\).

Practice: Make a table for each function.

1.) \(f(x) = x + 3\)
2.) \(y = x^3\)
3.) \(f(x) = -x + 5\)
Find the Range Given a Domain

**Problem:** For the function \( y = -2x + 5 \), find the range when the domain is 8.

Press  \[
\begin{array}{c}
2 \text{ND} \\
\text{WINDOW}
\end{array}
\]

Press  \[
\begin{array}{c}
y = \\
(-) \\
2 \\
X, T, 0, n \\
+ \\
5
\end{array}
\]

Press  \[
\begin{array}{c}
2 \text{ND} \\
\text{GRAPH}
\end{array}
\]

Practice: Find the range given the domain value.

1.) \( f(x) = 3x + 2 \), domain = 4

2.) \( y = -x + 2 \), domain = -2

3.) \( y = 7 - x \), domain = 9
**Linear Regression (Finding a Function Rule from a Table)**

**Problem**: Find the equation of a line containing the following points in the table.

<table>
<thead>
<tr>
<th>x</th>
<th>f(x)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
</tr>
</tbody>
</table>

Enter the values in the x column in L1. Enter the values in the f(x) column in L2.

Press STAT to select CALC

Press to select CALC

Press STAT to return to the main screen
Press \boxed{4} to select LinReg(ax+b)

```
LinReg(ax+b)
```

Press \boxed{2ND} \boxed{1} \boxed{,} \boxed{2ND} \boxed{2}

```
LinReg(ax+b) L1, L2
```

Press ENTER

```
LinReg
y=ax+b
a=1
b=4
```

**Practice:** Find the equation of a line containing the following points in the table.

1.)

<table>
<thead>
<tr>
<th>x</th>
<th>f(x)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>11.5</td>
</tr>
<tr>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>10</td>
<td>14.5</td>
</tr>
</tbody>
</table>

2.)

<table>
<thead>
<tr>
<th>x</th>
<th>f(x)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>-1</td>
<td>-8</td>
</tr>
<tr>
<td>1</td>
<td>-14</td>
</tr>
<tr>
<td>3</td>
<td>-20</td>
</tr>
</tbody>
</table>

3.)

<table>
<thead>
<tr>
<th>x</th>
<th>f(x)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>-6</td>
</tr>
</tbody>
</table>
**Mean**

**Problem:** Find the mean of the following set of numbers 45, 28, 53, 92, 85, 28

Put the numbers into L1

<table>
<thead>
<tr>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>53</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>92</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

L1(7)=

Press **2ND STAT**

Press → to select MATH

Press **3** to select mean.

```
mean(
```
Problems:

1.) Find the mean of 11, 25, 68, 31, 89

2.) Find the mean of 117, 40, 128, 42

3.) Find the mean of 92, 95, 88, 97, 79
**Median**

**Problem:** Find the median of the following set of numbers 45, 28, 53, 92, 85, 28

Put the numbers into L1

<table>
<thead>
<tr>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>53</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>92</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

L1(?)=

Press **2ND** **STAT**

Press **→** to select MATH

Press **4** to select median.

median( )
Press 2ND 1 ) ENTER

```
median(L1) 49
```

Problems:

1.) Find the median of 11, 25, 68, 31, 89

2.) Find the median of 117, 40, 128, 42

3.) Find the median of 92, 95, 88, 97, 79
Factorial

Problem: Find 8!

Press 8 MATH

Press → to select PRB

Press 4 to select !

Press ENTER

8! 40320

Problems:

1. 11!
2. 4!
3. 9!
Permutations

Problem: Find $8P_3$

Press $\boxed{8}$ MATH

Press $\rightarrow$ to select PRB

Press $\boxed{2}$ to select nPr

Press $\boxed{8}$ nPr

Press $\boxed{3}$ ENTER

$8 \text{nPr} 3 \quad 336$

Problems:

1.) Find $5P_2$  
2.) Find $11P_4$  
3.) Find $6P_5$
Combinations

Problem: Find \( 8C3 \)

Press \[ \text{MATH} \]

Press \[ \rightarrow \] to select PRB

Press \[ 3 \] to select nCr

\( 8 \ nCr \)

Press \[ 3 \ \text{ENTER} \]

\( 8 \ nCr \ 3 \ \boxed{56} \)

Problems:

1.) Find \( 5C2 \)  
2.) Find \( 11C4 \)  
3.) Find \( 6C5 \)