

TI-81 Calculator Operation

General Functions and operations.

Reset

To reset and clear all

| 2nd |

| + |

```

1: No
2: Reset

```

Use arrow keep to enter no or reset.

Also tells memory amounts in registers in calculator.

To adjust Display Contest

| 2nd |

| ^ |

Increases Contrast

| 2nd |

| \ / |

Decreases Contrast

Arrow at first to indicate using 2nd key

```

  ^ |           | 2 |
  _ |           | _ |

```

<---- then number when arrow key is held down, number indicates contrast.  
0 = lightest  
9 = darkest  
If number is 8 or 9 batteries will need to be replaced.

other useful keys

| clear |

clears screen

Quit

| 2nd |

| clear |

Ends current command returns to home display

^

Arrow keys allow cursor to move through  
the display.

<

>

√

Del

Deletes whatever cursor is over

Ins

Inserts wherever cursor is.

2nd

Stat

Enters Statistical Registers  
will calculate regression Stats  
and do scatter graphs

MatrX

VARS

Enters and calculates regression equation  
for graphing

y =

RANGE

ZOOM

Control graphing  
on calculator

Trace

GRAPH

To obtain the best fit straight line from experimental Data

To enter Experimental data:

1: | 2nd | | STAT |  
----- | |-----  
| | MATRIX |  
-----

2: Use arrow | ^ | keys to move cursor to | DATA |  
----- |-----

move cursor to 2: clear stat || | ENTER |  
-----

Display window will show

Clestat | ENTER |

DONE

3: | 2nd | | STAT |  
----- |-----| |-----|

1: EDIT | ENTER

Cursor is on  $X_1 =$

Enter  $X_1$ , or first X data point

Cursor down to  $Y_1$

Enter first Y data point

Cursor down to  $X_2$

Enter 2nd X data point

Cursor down to  $Y_2$

Enter 2nd Y data point

Continue until all data points have been entered--

II To view data points

1. check at top of calculator

y = (this should be blank; If not | del | or

| clear | to remove any data.

III For a scatter plot:

1. Set range (at top of calculator) | RANGE |

2. Use cursor keys to move through and change the following values.

$X_{\min}$  \ -----> values of X axis

$X_{\max}$  /

$Y_{\min}$  \ -----> values of Y axis

$Y_{\max}$  /

IV To view scatter points.

1. | 2nd | | STAT | |||

1. Cursor | \ / | | Draw |

3. | 2:scatter | | enter |

To Connect the points

1.  $\overline{\text{2nd}}$  | | STAT  
-----
2. DRAW
3. 3:xyline This is not a regression analysis but rather just to connect the points.

To obtain Regression equation.

1.  $\overline{\text{2nd}}$  | | STAT  
-----
2. Cursor to  $\overline{\text{2: LinReg}}$   
-----

obtain                    a = (y intercept)  
                          b = (slope)  
                          c = (correlation of points)  
For a standard line     $y = mx + b$   
                           $y = bx + a$

V To graph regression line

1. y = (check that display is blank)

2.  $\overline{\text{VAR}}$  |  
-----  
Cursor to  $\overline{\text{LR}}$

Cursor to  $\overline{\text{4: REG EQ}}$  | |  $\overline{\text{Enter}}$  |  
-----

This copies the regression equation to the graphing function.

3.  $\overline{\text{GRAPH}}$  | |  
-----
4. To obtain a point on curve.  
 $\overline{\text{TRACE}}$  | A cursor appears on line. Use  $\overline{\text{<--}}$  |  $\overline{\text{-->}}$  |  
----- to step through the line. -----

5. If the line is not sensitive enough

1.  $\overline{\text{ZOOM}}$  |  $\overline{\text{2: ZOOM 2}}$  |  
-----
2.  $\overline{\text{TRACE}}$  |  $\overline{\text{<--}}$  |  $\overline{\text{-->}}$  |  
-----

CONTINUE until point is obtained.....

To obtain the fit exline from experimental Data

1. Follow I, II, III, IV for the straight line.

2. To obtain regression equation.

1. 2nd | stat |

2. Cursor to 4: Exp Reg

Copies Exp Reg to screen | ENTER |

OBTAIN

a =

b =

r = (correlation of point)

To graph regression line follow V from best fit straight line

DATA

Beers Law Analysis of Nickel (II) Sulfate solutions.

Standard Curve

Trail	Concentration (mol/L)	Absorbance	
1	0.080	0.100	
2	0.160	0.201	
3	0.240	0.302	unknown 0.360
4	0.320	0.403	
5	0.400	0.510	

Does it obey Beers Law? Why?

What is the epsilon for this group of data?

What is the concentration of the unknown?

DATA

Boyles Law

Volume (mL)	Pressure (atm)
5.0	2.02
7.5	1.32
10.0	1.02
12.5	0.81
15.0	0.69
17.5	0.58
20.0	0.50

Regression Models

linear  $y = a + bx$

logarithmic  $y = a + b \ln(x)$

Exponential  $y = ab^x$

power  $y = ax$

a = y intercept (linear & log)

b = slope

r = correlation coefficient of the points