

# Calculating on the Casio cfx-9850G Plus

## 0. START/END/EXIT

Press  $\boxed{\text{AC/ON}}$   $\boxed{1}$  to start (in RUN mode) and  $\boxed{\text{SHIFT}}$   $\boxed{\text{AC/ON}}$  (i.e. OFF) to turn the calculator off. The calculator will turn itself off after an inactive period, but nothing is lost when this happens. Just turn it back on. If at some stage you are stuck, and can't see how to recover,  $\boxed{\text{EXIT}}$  may allow you to start over.

## 1. SCREEN CONTRAST

The screen can be adjusted to suit you. Press MENU E (use the  $\boxed{\text{cos}}$  key for E: note the small pink letter E just above it.) to access the CONTRast area. Use the  $\boxed{\blacktriangleleft}$  and  $\boxed{\blacktriangleright}$  cursors to select colours or the screen contrast; press the  $\boxed{\uparrow}$  and  $\boxed{\downarrow}$  keys to adjust these. Alternatively, press the  $\boxed{\text{F2}}$  key just below the word IN-A on the screen to initialise all settings. Press MENU 1 to return to RUN mode.

## 2. SYNTAX

Calculations are performed by constructing an expression, in conventional algebraic syntax, and then pressing  $\boxed{\text{EXE}}$ . Note that there is no equals key. Brackets are used when necessary. Some examples of acceptable syntax include the following, each of which is different from the equivalent on most scientific calculators, but is similar to the way expressions are conventionally written. Try each of these on your calculator, and observe both the screen display and the final result. It is not necessary to clear with  $\boxed{\text{AC/ON}}$  before each new calculation. Don't forget to press  $\boxed{\text{EXE}}$ .

$\boxed{\text{LOG}}$ $\boxed{2}$ $\boxed{\text{EXE}}$	for $\log_{10}2$
$\boxed{2}$ $\boxed{0}$ $\boxed{\times}$ $\boxed{-}$ $\boxed{1}$ $\boxed{1}$ $\boxed{\text{EXE}}$	for $2(5^2 - 1)$ (Note multiplication sign is optional)
$\boxed{4}$ $\boxed{\text{SHIFT}}$ $\boxed{1}$ $\boxed{\text{EXE}}$	for $4^{-1}$ (Note the yellow $x^{-1}$ above the $\boxed{1}$ key.)
$\boxed{5}$ $\boxed{\text{SIN}}$ $\boxed{3}$ $\boxed{\text{SHIFT}}$ $\boxed{\text{EXP}}$ $\boxed{\text{EXE}}$	for $5\sin 3$ (Note multiplication signs are optional)
$\boxed{3}$ $\boxed{-}$ $\boxed{5}$ $\boxed{\text{EXE}}$	for $3^5$
$\boxed{(-)}$ $\boxed{2}$ $\boxed{-}$ $\boxed{(-)}$ $\boxed{3}$ $\boxed{\text{EXE}}$	for $(-2) - (-3)$ (Note the use of $\boxed{-}$ and $\boxed{(-)}$ keys.)
$\boxed{\text{SHIFT}}$ $\boxed{\sqrt{x^2}}$ $\boxed{3}$ $\boxed{\text{EXE}}$	for $\sqrt{3}$ (Note the yellow $\sqrt{\quad}$ above the $\boxed{\sqrt{x^2}}$ key.)
$\boxed{\text{SHIFT}}$ $\boxed{\sqrt{-1}}$ $\boxed{3}$ $\boxed{\text{EXE}}$	for $\sqrt{-3}$ (Note the result is given as a complex number.)
$\boxed{\text{SHIFT}}$ $\boxed{\text{e}^x}$ $\boxed{2}$ $\boxed{\text{EXE}}$	for $e^2$ (Note that $\wedge$ is <i>not</i> used here.)
$\boxed{2}$ $\boxed{\text{A}^{\text{b/c}}}$ $\boxed{5}$ $\boxed{+}$ $\boxed{3}$ $\boxed{\text{A}^{\text{b/c}}}$ $\boxed{4}$ $\boxed{\text{EXE}}$	for $2/5 + 3/4$
$\boxed{\text{F-D}}$ $\boxed{\text{F-D}}$	toggles last result between fractions and decimals

## 3. SET UP

Press  $\boxed{\text{SHIFT}}$   $\boxed{\text{MENU}}$  to access the SET UP options. Use the  $\boxed{\blacktriangleleft}$  and  $\boxed{\blacktriangleright}$  keys for highlighting options and the function keys ( $\boxed{\text{F1}}$ ,  $\boxed{\text{F2}}$ , ...) to select choices. Note that Angle can be set to degrees, radians or grads. The format in which numerical results are given is controlled by Display. Press  $\boxed{\text{EXIT}}$  to return.

## 4. SUCCESSIVE COMMANDS

The screen will allow you to construct lengthy expressions if you want. Chain calculations are also permitted. The result of the most recent calculation is recorded as Ans. This result is used in chain calculations. It can also be directly recalled using  $\boxed{\text{2nd}}$   $\boxed{\text{(-)}}$ . For example, try the following key sequence, and note carefully the screen and the successive results to see what is happening:

$\boxed{1}$   $\boxed{4}$   $\boxed{+}$   $\boxed{1}$   $\boxed{5}$   $\boxed{+}$   $\boxed{1}$   $\boxed{6}$   $\boxed{+}$   $\boxed{1}$   $\boxed{7}$   $\boxed{+}$   $\boxed{1}$   $\boxed{8}$   $\boxed{+}$   $\boxed{1}$   $\boxed{9}$   $\boxed{+}$   $\boxed{2}$   $\boxed{0}$   $\boxed{+}$   $\boxed{2}$   $\boxed{1}$   $\boxed{\text{EXE}}$   
 $\boxed{+}$   $\boxed{7}$   $\boxed{\text{EXE}}$   
 $\boxed{\sqrt{x^2}}$   $\boxed{\text{EXE}}$

Various constant operations can be performed by taking advantage of the fact that  $\boxed{\text{EXE}}$  repeats the previous entry. For example, note the effect of the following key sequence:

$\boxed{3}$   $\boxed{\text{EXE}}$   
 $\boxed{+}$   $\boxed{5}$   $\boxed{\text{EXE}}$   $\boxed{\text{EXE}}$   $\boxed{\text{EXE}}$  ...

## 5. USING MENUS

The Casio-9850G Plus is menu-driven, which explains why the keyboard is relatively uncluttered. For example, many (powerful) functions are located in the (hierarchical) Options menu. Press **OPTN** and you will see several **menu names** displayed. Press **F6** to scroll through other menu names. Press the corresponding **F** key (underneath a menu name) to access a menu. A menu stays on the screen until you press **EXIT**.

To access a **menu command**, press the associated **F** key. Conventional syntax is used so that generally you construct an expression as you would write it on paper. To leave a menu without selecting a menu command press **EXIT**, which backs up one step. Press **F6** **F3** to select the PROBability menu and try the following examples of some of the menu commands:

**7** **F1** **EXE** for  $7! = 5040$   
**1** **5** **F3** **4** **EXE** for  ${}_{15}C_4 = 1365$   
**F4** **EXE** **EXE** **EXE** for successive random numbers on (0,1)  
**F6** **F1** **1** **1** **EXE** for standard normal probability distribution,  $\text{Prob}(z \leq 1) = 0.84134$   
**EXIT** **EXIT** to return to the home screen.

Using many commands requires a knowledge of calculator syntax. For example, in the CALCulate menu, press **F6** **F3** to select (and then, using the **X .T** key for  $X$ , construct the expression  $(X^2, X, 1, 10)$ . The comma key is below the **cos** key. Press **EXE** to get the sum of the squares of the first ten integers.

## 6. MEMORIES AND VARIABLES

Memories are named alphabetically, as if variables are being given values. Store in a memory by using **□** followed by **ALPHA** and the relevant pink letter key. For example, to store 5 in memory  $R$ , press **5** **□** **ALPHA** **6** **EXE**. (Note the letter  $R$  is just above the **6** key.) In addition to memories  $A$  to  $Z$ , there are memories  $r$  and  $\theta$  accessed via the **□** and **□** keys. Memories are recalled by first pressing the **ALPHA** key. The exception is memory  $X$  which can also be recalled using the **X .T** key. Give  $M$  the value 3 by storing 3 in memory  $M$  and then note the effects of commands like the following:

**5** **ALPHA** **6** **EXE** for  $5R$  (Multiplication sign is optional.)  
**ALPHA** **6** **ALPHA** **7** **EXE** for  $RM$ . (Multiplication sign is optional.)  
**3** **ALPHA** **6** **□** **ALPHA** **7** **EXE** for  $3R^2M$  (Multiplication signs are optional.)  
**2nd** **□** **(** **ALPHA** **6** **□** **+** **ALPHA** **7** **□** **)** **EXE** for  $\sqrt{R^2 + M^2}$

You can use the same key to store up to six *ordered lists* of values. Eg., **1,2,5** **□** **LIST** **1** stores the three values (1,2, and 5) into List 1. Use **SHIFT** and **□** or **+** for curly brackets, **OPTN** **F1** **F1** to get the List command. The comma key is below the **cos** key.

## 7. EDITING COMMANDS

A command can be edited before **EXE** is pressed by using the **←** and **→** keys. Move the cursor to the thing you want to change, and then write over it by pressing the desired keys. The **DEL** and **INS** (**SHIFT** **DEL**) key allow you to delete or insert items. Move the cursor to the right spot first. You can execute a command at any time by pressing **EXE**. It is not necessary to return the cursor to the end of the line.

After pressing **EXE**, the immediately previous command can always be recalled by pressing **←** or **→**. This is rather handy when a succession of values of a complex expression are sought. For example, if you have just found  $18(1.02)^{20}$  with the key sequence **1** **8** **□** **1** **□** **0** **2** **□** **2** **0**, to then evaluate  $18(1.02)^{25}$  the following is sufficient:

**←** **←** **5** **ENTER**, and  
**←** **←** **←** **3** **ENTER** will then evaluate  $18(1.02)^{35}$ , and  
**←** **←** **←** **←** **←** **5** **→** **1** **ENTER** will then evaluate  $18(1.05)^{15}$ , and so on.

Finally, press **AC/ON** and then **□** **□** **□**... for 'deep recall' of previous commands to edit.

# Graphing on the Casio cfx-9850G Plus

## 1. DEFINING A FUNCTION

To graph a function, you must first define the function. Press MENU 5 to access GRAPH mode and the list of up to 20 functions. If some functions are already defined, use  $\leftarrow$  and  $\rightarrow$  to access them and then  $\boxed{\text{F2}}$  (DEL)  $\boxed{\text{F1}}$  to delete them before you start.

The  $\boxed{\text{X}} \cdot \boxed{\text{T}}$  key enters the variable (X), and the other keys are used in the usual way. Standard algebraic syntax is used, so multiplication signs are optional. For example, to enter the function  $f(x) = x^3 - 3x + 1$ , use  $\leftarrow$  and  $\rightarrow$  to choose a space, then press  $\boxed{\text{X}} \cdot \boxed{\text{T}} \boxed{-} \boxed{3} \boxed{-} \boxed{3} \boxed{\text{X}} \cdot \boxed{\text{T}} \boxed{+} \boxed{1} \boxed{\text{EXE}}$ .

Once a function is defined, it will be graphed on the current window settings by  $\boxed{\text{F6}}$  (DRAW). (A small square at upper right shows the calculator is working.)

To see the graph on a convenient window, press  $\boxed{\text{SHIFT}} \boxed{\text{F3}}$  and then  $\boxed{\text{F1}}$  (INIT)  $\boxed{\text{EXIT}}$ . For the INIT screen, x- and y-axis scales are equal and each pixel represents 0.1 units.

Press  $\boxed{\text{F6}}$  (G-T) to return to the function list if you want.

## 2. READING AND CHANGING THE SCREEN

If you press the  $\boxed{\text{SHIFT}} \boxed{\text{F3}}$  (Viewing Window) key, you will see the current information about the x and y axes, which also helps interpreting the screen. The values of Xscale and Yscale determine the tick marks on the axes. Change the values of Xmin, Xmax, Ymin and Ymax by overwriting them, followed by  $\boxed{\text{EXE}}$ .

Note shortcuts with  $\boxed{\text{F1}}$ ,  $\boxed{\text{F2}}$  and  $\boxed{\text{F3}}$ . Use  $\leftarrow$  and  $\rightarrow$  to move between values. Press  $\boxed{\text{EXIT}}$  when done.

Press  $\boxed{\text{SHIFT}} \boxed{\text{MENU}}$  to access SET UP for Graph mode. Many choices are available to customise the calculator. E.g., notice the effect of turning on the Grid. Graph Func shows the definitions of functions on the screen, while Draw Type allows for discrete points to be plotted or connected.

## 3. TRACING A GRAPH

A graph may be traced using the  $\boxed{\text{SHIFT}} \boxed{\text{F1}}$  (TRACE) key. A flashing cursor (a plus sign) appears on the graph, and its coordinates appear at the bottom of the screen. This can be moved to left or right along the graph using  $\leftarrow$  or  $\rightarrow$ . Move to the smallest root to see  $x = -1.9$ .

Use  $\leftarrow$  and  $\rightarrow$  to move between graphs when there is more than one.

## 4. ZOOMING IN AND OUT

To get a more accurate view of part of the graph, we can 'zoom in', which is rather like using a magnifying glass; or we can see a bigger picture by 'zooming out'. Press  $\boxed{\text{SHIFT}} \boxed{\text{F2}}$  (ZOOM) to access the zoom menu, then  $\boxed{\text{F3}}$  (IN) to zoom in on the cursor point. Notice how zooming in makes curves 'straighter'. By repeating the process a few times, perhaps moving the cursor a little each time, a rather accurate approximation to the root at  $x = -1.879$  can be found. Note that  $\boxed{\text{F4}}$  (OUT) zooms out, undoing the zooming in. Other zoom commands are available, some after pressing  $\boxed{\text{F6}}$ ; e.g., return to the original screen with (ORIG), the previous screen with (PRE) and equalise the scales on the axes with (SQR). Check settings with  $\boxed{\text{SHIFT}} \boxed{\text{F3}}$  (V-WINDOW).

## 5. BOX ZOOMING

A particular part of the graph can be magnified by using the 'box' method. First press  $\boxed{\text{F1}}$  (BOX) in the Zoom menu. Then move the cursor to a point to the left of and above the part of the graph you wish to magnify. Press  $\boxed{\text{EXE}}$  to confirm your choice. Now use the  $\rightarrow$  and  $\downarrow$  keys to move to the right and below the parts of interest. (A rectangular 'box' will be formed on the screen as you do this.) When the appropriate part is boxed, press  $\boxed{\text{EXE}}$ . Repeat this procedure to find the largest root of  $f$ , at  $x = -1.879$ .

## 6. LEAVING THE GRAPH SCREEN

RUN mode can be accessed at any time by pressing MENU 1. Note also that pressing  $\boxed{\text{X}} \cdot \boxed{\text{T}} \boxed{\text{EXE}}$  will read memory X, which contains the current x-coordinate of the cursor. Similarly  $\boxed{\text{ALPHA}} \boxed{-} \boxed{\text{EXE}}$  will read memory Y, which contains the current y-coordinate of the cursor. These memories are changed continuously by graphing. Pressing  $\boxed{\text{SHIFT}} \boxed{\text{F6}}$  in RUN mode will show the graph screen, but press MENU 5 instead if you want to do more than just look at the graphs.

## 7. GRAPHING MORE THAN ONE FUNCTION

Use the  $\leftarrow$  and  $\rightarrow$  keys to move the cursor to a new space. Define a function in the usual way. When  $\boxed{F6}$  (DRAW) is pressed, both (all) functions in the function list will be graphed together. The zoom facilities will now work on all functions at once. Once  $\boxed{TRACE}$  is pressed, you can toggle among the functions defined using the  $\leftarrow$  and  $\rightarrow$  keys.

To prevent a function from graphing, move the cursor to the function and press  $\boxed{F1}$  (SEL). Notice that the equals sign becomes unshaded. Repeat to restore a graph.

Each graph can be coloured blue, orange or green. Highlight a function in the list and press  $\boxed{F4}$  (COLR) to choose.

## 8. DEFINING RELATED FUNCTIONS

A function can be defined in terms of a function that has already been defined. (Eg.,  $Y2 = Y1 - 1$ ) Press  $\boxed{VARS}$   $\boxed{F4}$   $\boxed{F1}$  (Y) to refer to the name of a function. Do *not* use the keyboard Y ( $\boxed{ALPHA}$   $\boxed{-}$ ).

A family of functions can be graphed by using a list of values in place of a coefficient.

For example,  $Y1 = X^2 - \{0,1,2\}$  defines three quadratic functions,  $y = x^2$ ,  $y = x^2 - 1$  and  $y = x^2 - 2$ . Use  $\boxed{SHIFT}$   $\boxed{x}$  and  $\boxed{SHIFT}$   $\boxed{\div}$  for the curly brackets.

## 9. TABLES OF VALUES

Instead of a graph, a table of values for the same functions as those on the list in Graph mode can be obtained. Use MENU 7 to enter Table mode and  $\boxed{F6}$  (TABL) to show a table. The values in the table can be scrolled using the  $\leftarrow$   $\rightarrow$   $\uparrow$   $\downarrow$  keys; note the large print values at the bottom right of the screen. Return to the function list with  $\boxed{EXIT}$ . Use  $\boxed{F5}$   $\boxed{RANG}$  to adjust the starting point (*Start*), ending point (*End*) and the *x*-increment (*pitch*) for the table, by over-writing them. Press  $\boxed{EXIT}$  when done.

## 10. AUTOMATIC CALCULATION

When graphs are showing, various aspects of functions can be automatically obtained from the Graph Solve menu using  $\boxed{SHIFT}$   $\boxed{F5}$  (G.SOLVE). Select an aspect with the appropriate  $\boxed{F}$  key. The syntax for these aspects varies.

For example, press  $\boxed{F1}$  (ROOT) to find function roots. Use  $\leftarrow$  to select a function and  $\boxed{EXE}$  to register your choice. The first root (from left to right) will be found. (A small square at upper right shows the calculator is working.) Just press  $\rightarrow$  to find the next root. (Watch the cursor move along the graph!)

Finding points of intersection with  $\boxed{F5}$  (ISCT) requires you to select each of a *pair* of functions, if there are more than two graphs on the screen.

Definite integrals require you to select the lower and then the upper limits, pressing  $\boxed{EXE}$  after each.

To find numerical derivatives of functions, turn on the *Derivative* command in SET UP ( $\boxed{SHIFT}$   $\boxed{MENU}$ ). Then tracing will show numerical derivatives as well as coordinates at each point. Derivatives will also be given in Table mode.

## 11. OTHER GRAPHS

In the function list for either Graph or Table modes,  $\boxed{F3}$  (TYPE) allows you to choose various kinds of graphs, including polar graphs, parametric graphs, vertical graphs and graphs of inequalities. Once you have made a choice, the  $\boxed{x}$   $\boxed{.T}$  key will work differently: *r* replaces *y* and  $\boxed{x}$   $\boxed{.T}$  now gives  $\theta$  rather than *X* for polars, for example. The top line of the screen records your choice.

For polar and parametric graphs, graph settings are still chosen from  $\boxed{F3}$  (V-WINDOW). To see the current settings for *T* and  $\theta$ , use the  $\rightarrow$  key to advance past the bottom of the viewing window.

Graphs of conic sections are available in CONICS mode (MENU 9). First use the  $\leftarrow$  and  $\rightarrow$  keys to select the appropriate conic, followed by  $\boxed{EXE}$ . Enter the coefficients, choose a suitable viewing window (with  $\boxed{SHIFT}$   $\boxed{F3}$ ) and then press  $\boxed{F6}$  (DRAW).

Dynamic graphs, consisting of graphs of families of related functions are available in DYNA mode (MENU 6). A number of standard families are built in (B-IN), and one of the coefficients has to be identified as the variable (VAR). A value is needed for any other coefficients. For the variable coefficient, a range (RANGE) of suitable values is needed. Press  $\boxed{F6}$  (DYNA) to start dynamic graphing and  $\boxed{AC/ON}$  to stop it.

# Data Analysis on the Casio cfx-9850G Plus

## 1. DATA ENTRY AND EDITING

From RUN mode, press **MENU** **2** to enter STAT mode. Data are entered in Lists, labelled List 1 to List 6. Move between and around lists using the cursor keys. Enter data in columns, followed by **EXE**. Correct any typing errors by moving the cursor to the incorrect entry and then entering the correct value.

To delete an existing column of data before entering new data, first move the cursor to the column with **⬅** or **➡**. Then press **F6** and **F4** (DEL·A). Finally, press **F1** (YES) to confirm.

## 2. STATISTICS

Various statistics can be calculated by first pressing **F2** (CALC). (If the **F2** key does not show the CALC menu name, first press the continuation key, **F6**.) Both univariate (1VAR) and bivariate (2VAR) statistics are available. Use the cursor to see the rest of the statistics, since there is more than a whole screenful available.

Various regression coefficients and a correlation coefficient are also available for bivariate data; press **F3** (REG) and choose the preferred model.

Press **F6** (SET) to select a variable to be used for univariate statistics and a pair of variables for bivariate statistics. (Notice that frequencies can be set as 1 or as a variable list, depending on the nature of the data.) Press **EXIT** when finished setting these.

## 3. GRAPHS

Press **EXIT** to return to the data screen. Various kinds of graphs of data can be drawn after pressing **F1** (GRPH).

For most graphs, it is best to start by setting the calculator to automatically choose suitable scales. Press **SHIFT** **MENU** and check that *Stat Wind* is set to *Auto* and *Resid List* is set to *None*. Press **EXIT** to return.

Three graphs, referred to as Graph 1, 2 and 3 can be defined at once. Each of the three graphs can be set by first pressing **F6** (SET). Use the **⬇** cursor to choose what sort of graph you want, and to identify the variables.

To draw a graph, press one of the immediate commands **F1** (GPH1), **F2** (GPH2) or **F3** (GPH3). Press **EXIT** to return to the data after drawing a graph.

For bivariate data, the most likely choices are for a scatter graph (*Scat*) or a line graph (*xy*). Once a bivariate graph is drawn, data can be traced with **SHIFT** **F1**. Alternatively, regression models can be fitted using the appropriate function keys. When a regression model is chosen, the relevant regression function is shown. You can then press **F5** (COPY) to copy the function into the function graphing list or **F6** (DRAW) to draw the graph on the screen. (It is not necessary to copy the function.) Several regression lines can be drawn in succession.

Residuals can be computed and analysed by first pressing **SHIFT** **MENU** and then choosing a suitable list in which to store them in *Resid List*. (The contents of the list will be replaced by the residuals.) To plot residuals, first define a suitable graph.

For univariate data, a box plot is a good choice. If a histogram is preferred to represent univariate data, it is best to first change *Stat Wind* to *Manual*, and then to adjust the viewing window to suit the likely values (*x*) and frequencies (*y*). When the histogram is drawn, the *pitch* variable will represent the interval width.

More than one graph can be drawn at once (e.g. a pair of box plots). Use **F4** (SEL) to select which graphs are to be drawn.

#### 4. SORTING DATA

Data lists can be sorted into ascending or descending order, either independently, or keeping columns together. Press the continuation key  $\boxed{\text{F6}}$  to see the two choices  $\boxed{\text{F1}}$  (SRT·A) and  $\boxed{\text{F2}}$  (SRT·D).

If several lists are to be sorted together, you will need to identify a *Base List* to be sorted; other lists will follow this list.

*Be careful:* once sorted, data cannot be restored automatically to the original order.

#### 5. DATA TRANSFORMATIONS

New variable lists can be constructed by transforming existing lists. To define a new variable list in this way, first use  $\boxed{\text{▲}}$  to position the cursor in the title cell at the top of the list.

Then define the new variable as a transformation of one of the other list variables. Press

$\boxed{\text{OPTN}} \boxed{\text{F1}}$  (LIST) to bring the List variables to the screen. Then use  $\boxed{\text{F1}}$  (LIST) to identify list variables. For example, to define a variable in *List 3* that is the sum of the two variables in *List 1* and *List 2*, enter the command *List1 + List2* at the top of *List 3* column, and then press  $\boxed{\text{EXE}}$  to confirm your choice.

You can define a list variable in terms of itself, too. For example, the command *log List1* at the top of *List 1* will replace each value in *List1* by its logarithm to base 10.

#### 6. ANALYSING DATA FROM TABLES

Data in a table can be electronically transferred to a list and hence analysed. This is a particularly useful facility for dealing with simulated data.

With the cursor placed in the appropriate column of the table, press  $\boxed{\text{OPTN}} \boxed{\text{F1}} \boxed{\text{F2}}$  (LMEM) to show the *List Memory* function. Choose one of the six lists into which to store the data from the table. (Choose carefully, since this will erase whatever data is already in that list, and replace it with the data from the table.)

#### 7. PREDICTING WITH A REGRESSION LINE

After a regression line is constructed, predictions can be made in RUN mode (MENU 1). Press

$\boxed{\text{OPTN}} \boxed{\text{F5}}$  (STAT) to bring the *x* and *y* predictions to the screen. To make a prediction, using the last regression model found, press the score followed by the variable to be predicted. For example, to predict the *y* value when *x* = 10, press 10  $\boxed{\text{F2}}$  (*y*).

#### 8. RECALLING STATISTICS

After calculation, any statistics are stored in the VARS menu. In RUN mode, press  $\boxed{\text{VARS}}$  followed by  $\boxed{\text{F3}}$  (STAT) to select them.

#### 9. STATISTICAL INFERENCE

Hypothesis testing and confidence interval construction are both available after data have been entered. Press  $\boxed{\text{F3}}$  (TEST) to select a test or  $\boxed{\text{F4}}$  (INTR) to construct an interval. Data need to be identified as lists or as variables (in which case, statistical summary data are entered). Use the cursor keys to complete all the necessary inputs before *executing* the analysis. For most tests, a probability distribution can be drawn with  $\boxed{\text{F6}}$  (DRAW) as well as a relevant calculation completed by pressing  $\boxed{\text{F5}}$  (CALC).

#### 10. DATA LOGGING

Data can be retrieved from a Casio EA-100 Data Analysis unit by first connecting with a cable (SB-62), then executing a *Receive* command on the calculator. Press  $\boxed{\text{SHIFT}} \boxed{\text{VARS}}$  (PRGM) and then  $\boxed{\text{F6}} \boxed{\text{F4}}$  (I/O), followed by  $\boxed{\text{F4}}$  (RECV). Data must be stored into one of the calculator lists. Note that time data are always transmitted first by the data logger. For example, the commands *Receive(List5)*  $\boxed{\text{EXE}}$  followed by *Receive(List6)*  $\boxed{\text{EXE}}$  will store the Time data into *List 5* and the measurements made into *List 6*. Use  $\boxed{\text{OPTN}} \boxed{\text{F1}}$  (LIST) to obtain the List command. After data are received, they can be analysed in the same way as other data.