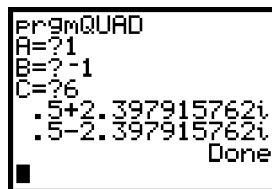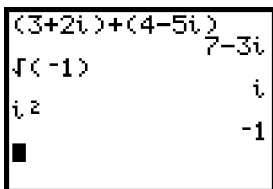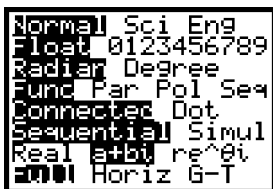When entering a complex number, you get the symbol i by pressing [2nd] [i],
or if you are in a+bi mode, by entering $\sqrt{(-1)}$.

Note 7F • MANDELBR Program

The program MANDELBR is based on the principle that, if a point moves
more than 2 units from the origin, it will never return. If it remains within
2 units of the origin after 50 iterations, then it will likely stay in that range,
so the program turns on the corresponding pixel.

First set the window you want to explore. To view the entire Mandelbrot set,
set the window to $[-2, 1, 1, -1, 1, 1]$. Then run the program MANDELBR.
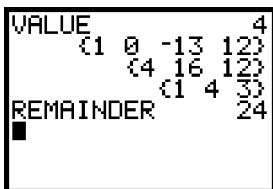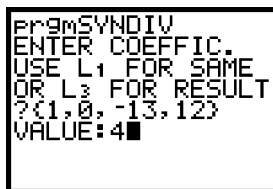Running this program can take several hours.

$[-2, 1, 1, -1, 1, 1]$

```
PROGRAM:MANDELBR                              0→N:0→Z
a+bi                                          While N≤50 and abs(Z)≤2
PlotsOff                                      N+1→N
ClrDraw                                       Z²+A+Bi→Z
FnOff                                         End
RectGC:CoordOn:GridOff:AxesOn                 If abs(Z)≤2
DispGraph                                     Pt-On(A,B)
For(A,Xmin,Xmax,(Xmax-Xmin)/94)               End
For(B,Ymin,Ymax,(Ymax-Ymin)/62)               End
```

Note 7G • SYNDIV Program

The program SYNDIV performs the synthetic division $\frac{P(x)}{x - a}$.

    a. Run the program SYNDIV.

    b. Enter the coefficients of the divisor, polynomial $P(x)$, as a list. These
        values must be entered in order of descending degree, including zeros for
        missing terms, and they must be separated by commas and enclosed in
        braces, { }. Press [ENTER].

    c. For VALUE enter the value of a in the divisor $x - a$ as an integer, decimal,
        or fraction. Press [ENTER].

    d. The program displays the coefficients of $P(x)$ that you entered, the middle
        row of the division, and then the coefficients of the quotient polynomial
        in the third line. It displays the remainder of the division in the last line.

(continued)