

Greatest Common Denominator with User Input for the Casio fx-5800P Calculator
https://github.com/slugrustle/fx-5800P_progs

```
1  0→DimZ:
2  27→DimZ:
3  0→A:
4  "ENTER -1 AFTER  LAST INPUT":
5  While 1:
6    "NUMBER"?→B:
7    B=-1⇒Break:
8    If B≠Int(B):
9      Then Cls:
10     "NUMBER MUST BE  AN INTEGER":
11     Stop:
12  IfEnd:
13  If B<1 Or B≥1×1010:
14    Then Cls:
15    "NUMBER MUST BE  >0 And <1×1010":
16    Stop:
17  IfEnd:
18  A+1→A:
19  If A≤27:
20    Then B→Z[A]:
21  Else Cls:
22    "SUPPORTS AT MOST27 NUMBERS":
23    Stop:
24  IfEnd:
25  WhileEnd:
26  If A<2:
27    Then Cls:
28    "REQUIRES 2 OR  MORE NUMBERS":
29    Stop:
30  IfEnd:
31  A→D:
32  Z[D]→B:
33  For D-1→A To 1 Step -1:
34    Z[A]→C:
35    While B≠C:
36      If B≥C:
37        Then B-C×Int(B÷C)→B:
38        B=0⇒C→B:
39      Else C-B×Int(C÷B)→C:
40      C=0⇒B→C:
41    IfEnd:
42  WhileEnd:
43  Next:
44  1→C:
45  Int(D÷3)→E:
46  D-3×E>0⇒E+1→E:
47  Lbl 1:
48  Cls:
```

```
49  Locate 1,1,B:
50  Locate 12,1,C:
51  Locate 13,1,"":
52  Locate 14,1,E:
53  3×(C-1)+1→A:
54  Locate 1,2,Z[A]:
55  A+1≤D⇒Locate 1,3,Z[A+1]:
56  A+2≤D⇒Locate 1,4,Z[A+2]:
57  While 1:
58    Getkey→F:
59    If F=34 Or F=73:
60      Then Cls:
61      "DONE":
62      Stop:
63  IfEnd:
64  If F=77 Or F=84 Or F=86 Or F=47:
65    Then C+1→C:
66    C>E⇒1→C:
67    Goto 1:
68  IfEnd:
69  If F=67 Or F=83 Or F=85:
70    Then C-1→C:
71    C<1⇒E→C:
72    Goto 1:
73  IfEnd:
74  WhileEnd
```

Program Outline

Lines 1–2: Set up memory for extra variables $Z[\alpha]$ where $\alpha \in [1, 27]$.

Lines 3–31: User input of arguments for $\text{GCD}(Z[1], \dots, Z[D])$. $D \in [2, 27]$.

Lines 32–43: Evaluate $B = \text{GCD}(Z[1], \dots, Z[D])$. Uses $\text{GCD}(\beta, \gamma, \delta, \epsilon) = \text{GCD}(\text{GCD}(\text{GCD}(\beta, \gamma), \delta), \epsilon)$.

Lines 44–74: Display result and inputs.

Variable Descriptions

A: Index into extra variable memory.

B: User input and GCD evaluation.

C: GCD evaluation and number of displayed input argument page.

D: Number of input arguments.

E: Number of input argument display pages (3 inputs per page).

F: Identifier of most recently pressed key.

Notes

Lines 4, 10, 15, 22, and 28: The weird spacing prevents text wrapping from occurring in the middle of a word.

Line 13: The fx-5800P can only represent numbers on the range $[-1 \times 10^{10}, 1 \times 10^{10}]$ as exact integers.

Line 59: Pressing DEL (34) or EXIT (73) ends the program.

Line 64: Pressing + (77), ▲ (84), ► (86), or EXE (47) cycles to the next input argument display page.

Line 69: Pressing - (67), ◀ (83), or ▼ (85) cycles to the previous input argument display page.

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