

Greatest Common Divisor with User Input for the Casio fx-5800P Calculator

https://github.com/slugrustle/fx-5800P_progs Version 1

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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:

```

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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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