

## Calculator Program: ModInv

This calculator program was written for a TI-83. It is designed to compute the inverse of a number in modulus  $M$  (or in  $\mathbb{Z}_M$ ).

How to use:

Run the program.

It will ask, "Modulus?" Enter what mod you are working in.

It will ask, "Number?" Enter the number you want to find the inverse of.

The program will then return the inverse of the number in the specified mod. Note, not all numbers have an inverse in all mods.

Program: ModInv

```
ClrHome
Disp " "
Input "Modulus?", M
Disp " "
Input "Number?", A
0→N
A-M*int(A/M) →A
If A=0
Goto C
0→K
A→V
M→U
1→N
0→W
Lbl A
Int(U/V)→Q
U-Q*V→R
Q*N+W→Z
K+1→K
IF R=0
Goto B
V→U
R→V
N→W
Z→N
Goto A
Lbl B
If 2*int(K/2)=K
M-N→N
If V>1
0→N
Lbl C
ClrHome
Disp " "
If N=0
Then
Disp "No Inverse"
Else
Disp "Inverse =", N
End
```