

## HP Forum Archive 17

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### Re: Valentine's Day MC: A few modest insights, n! digits - part 3, anyone?

Message #1 Posted by [Valentin Albillo](#) on 21 Feb 2007, 9:10 a.m.

Hi, Gerson:

Very nice !

Thanks, Gerson, and

Best regards from V.

### Re: Valentine's Day MC: A few modest insights, n! digits - part 3, anyone?

Message #2 Posted by [Gerson W. Barbosa](#) on 21 Feb 2007, 7:20 p.m.,  
in response to message #1 by [Valentin Albillo](#)

Hello Valentin,

Quote:

Very nice !

Thanks, but those two lines of mine are not nearly as nice as the other 17 ones of yours!

Here is my first attempt for the HP-12C. Took more than 5 minutes though :-)

```
01  ENTER
02  LN
03  LST x
04  .
05  5
```

```

06 +
07 *
08 x<>y
09 -
10 1
11 1
12 12/
13 +
14 1
15 0
16 LN
17 /
18 1
19 +
20 INTG

```

$2 \leq n \leq 100,000,000$  (wrong! see update below)

$$N = \text{INT}(1 + ((n + 1/2) * \ln(n) - n + 11/12) / \ln(10))$$

$$\ln(\sqrt{2 * \pi}) = 0.918938533$$

$$11/12 = 0.916666667$$

20 steps! Not so bad, considering the 12C lacks pi and common logarithm...

Best regards,

Gerson.

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Update:

Unfortunately, 11/12 is not good enough. The results are one unit less for  $N=197, 216, 1944, 2512$ , etc. 34/37 would raise the upper limit to 165534. And 1213/1320 would raise it to 2064172, but in this case it would be better go back to the original formula and start over. Approximating pi as 355/113 (8 steps) would not be of much help...

*Edited: 22 Feb 2007, 6:08 p.m.*