

NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER

WASHINGTON, D.C. 20087 20034

N REPLY REFER TO 840:JWW:ahc 4 FEB 1971

Dr. Neil J.A. Sloane Bell Telephone Laboratories 600 Mountain Avenue Murray Hill, New Jersey 07974

Dear Dr. Sloane,

I am naturally gratified to learn that you enjoyed your brief visit here on 13 January, and I can assure you that the pleasure on that occasion was mutual.

In reply to your inquiry as to what additional mathematical constants (besides e, π , $\sqrt{2}$, $\sqrt{3}$, $\sqrt{5}$, γ , $\ln 2$, \log_{10} e) should be included in your table, I would suggest $\sqrt[3]{2}$, $\sqrt[3]{3}$, $\ln 3$, $\ln 10$, $\sqrt{\pi}$, π^2 , e^{π} , e^{γ} , $\ln \gamma$, φ , and $\ln \varphi$, where φ is the golden ratio, which, of course, is equal to $(\sqrt{5}+1)/2$. These were suggested by the list compiled by Dr. Knuth for inclusion in his extended work entitled "The Art of Computer Programming", of which the first two volumes have appeared.

Here, as you requested, are my most extended decimal approximations to ζ (3) and Catalan's constant:

- $\zeta(3) = 1.20205\ 69031\ 59594\ 28539\ 97381\ 61511\ 44999\ 07649\ 86292\ 34049\ 88817\ 92271\ 55534\ 18382\ 05786\ 31309\ 01864\ 55873\ 60933\ 52581\ 46199\ 15779\ 52607\ 19418\ 49199\ 59986\ 73283\ 21377\ 63968\ 37207\ 90016\ 14539\ 41782\ 94936\ 00667\ 19191\ 57552\ 22424\ 94243\ 96156\ 39096\ 64\cdots$
- u_2 = 0.91596 55941 77219 01505 46035 14932 38411 07741 49374 28167 21342 66498 11962 17630 19776 25476 94793 56512 92611 51062 48574 42261 91961 99579 03589 88033 25859 05943 15947 37481 15843 ...

Finally, I enclose reprints of two papers on Khintchine's constant and a corrected reprint of the paper 'Concerning Two Series for the

Gamma Function," which you requested. The errors in Tables 2 and 3 of the last paper were pointed out to me by Professor Robert S. Spira, who is publishing an extension of these tables (also Table 1) in a paper entitled "Calculation of the Gamma function by Stirling's formula," which will appear in the April 1971 issue of Mathematics of Computation.

I trust that this information is what you require. If you need more material of this sort please let me know.

Sincerely,

John W. Wrench Jr. JOHN W. WRENCH, JR.

Encls.