ABSTRACTS OF PAPERS

SUBMITTED FOR PRESENTATION TO THE SOCIETY

The following papers have been submitted to the Secretary and the Associate Secretaries of the Society for presentation at meetings of the Society. They are numbered serially throughout this volume. Cross references to them in the reports of the meetings will give the number of this volume, the number of this issue, and the serial number of the abstract.

323. R. G. Archibald: *Relatively highly composite numbers.*

Highly composite numbers have been defined and properties have been obtained by S. Ramanujan. The present paper defines a *relatively highly composite number* with reference to a sequence of integers containing an infinitude of primes. For such an arbitrary sequence it is shown that the series of reciprocals of the relatively highly composite numbers is convergent. Further results are obtained for relatively highly composite numbers with respect to arbitrary sequences, and also with respect to certain classes of sequences. (Received July 26, 1938.)

324. L. A. Aroian: *The moments of F and of z.*

R. A. Fisher has shown that the distribution of $z=1/2 \log s_1^2/s_2^2$ is $P(z) = (2n_1^{n_1/2}n_2^{n_2/2}e^{n_1 z})dz/B(n_1/2,\ n_2/2)(n_1e^{2z}+n_2)^{(n_1+n_2)/2}$ and that of $F=e^{2z}$ is $P(F) = (n_1^{n_1/2}n_2^{n_2/2}F^{n_1/2-1})dF/B(n_1/2, n_2/2)\cdot(n_1F+n_2)^{(n_1+n_2)/2}$. From these, the moments of F and the semi-invariants of z are found, and the approach to normality of both distributions is studied. By use of the Type III curve, the results are applied to finding approximations of the 5% and 1% points of z. Other applications are indicated. (Received July 14, 1938.)

325. D. H. Ballou: *On the location of the roots of real polynomial equations when two roots are equal.*

If $a+ib$ is a complex root of the real polynomial equation $f(x)=\sum_{k=0}^{n}a_kx^k=0$, then the point (a, b) lies on the curve $\phi(x, y)\equiv f'(x)-y^2f'''(x)/3!+\cdots+(iy)^{\lambda-1}f^{(\lambda)}(x)/\lambda! =0$, where λ is the largest odd integer less than or equal to n. In this paper, equations $f(x)=0$ which have double roots are considered, and it is proved that if $a'+ib'$ is any root either real or complex, other than the double root, then the point (a', b') is a real focus of the curve $\phi(x, y)=0$. (Received July 25, 1938.)

326. W. D. Baten: *Concerning the distribution of the means of n independent chance variables when each is subject to a certain frequency law.*

The first four moments about the mean of the distribution of the sample averages were derived by employing results obtained from sampling theory. On applying Pearson's criteria for his types, it was found that the distribution of the sample