QUERIES—REPLIES

50. A Definite Integral (Q 41, v. 6, p. 125).

In the definite integral

\[ I = \int_0^\infty u^{-1} \exp (-zu - u^{-2}) du \]

put \( z = 2x^3, v = xu \) so that

\[ I = \int_0^\infty v^{-1} \exp \left[ -x^2(2v + v^{-2}) \right] dv. \]

In this form the integral can be evaluated asymptotically by Laplace's method. \( f(v) = 2v + v^{-2} \) has its maximum at \( v = 1 \), and for large \( x \) the integral is approximated by

\[ \left( \frac{2\pi}{x^2 f''(1)} \right)^{1/4} \exp \left[ -x^2 f(1) \right] \]

or

\( (\pi/3)^{1/4} e^{-3x^2} \).

This approximation may be used to start an asymptotic expansion: successive terms may be computed from the differential equation stated in the query.

A. E.

\[ \text{Editorial Note: Dr. J. Ernest Wilkins also obtained the dominant term of the asymptotic expansion of this integral for large values of } z. \]

CORRIGENDA

v. 3, p. 355, l. -12, for 10\( ^{12} \) read 10\( ^{10} \).
v. 6, p. 20, l. -5, for \( n < 50 \) read \( n \leq 50 \).
v. 6, p. 25, l. 14, for 1.2(5) read 1.2(05).
v. 6, p. 25, l. 14, for 2–3D read 3–4D.
v. 6, p. 25, l. -20, for R52 read R53.
v. 6, p. 32, l. -7, for JOHNSTON read JOHNSTON.
v. 6, p. 34, l. 7, for 1950 read 1949.
v. 6, p. 34, l. 9, for 21 read 206.
v. 6, p. 55, l. -4, for \( y_i \) read \( y_x \).
v. 6, p. 58, l. 18, for 33 read 5.
v. 6, p. 58, l. 20, for 35 read 5.
v. 6, p. 61, l. -8, for 116 read 118.
v. 6, p. 82, l. 6, for TABLIŠŠY read TABLIŠŠY.
v. 6, p. 86, l. -17, for \( \rho = 0.6 \) read \( \rho = 0.0 \).
v. 6, p. 101, l. -11, for 7956 read 7556.