$I_{0.8}(3, 4)=1-I_{0.2}(4, 3)=1-0.0169600=0.9830400$. In this simple case it is easy to check results by comparing with the actual expansion:

$$\begin{aligned}(1.25-0.25)^{-3} &= (1.25)^{-3}(1-0.2)^{-3}\\ &= 0.512\left[1+3(.2)+\frac{3\cdot 4}{1\cdot 2}(.2)^2+\frac{3\cdot 4\cdot 5}{1\cdot 2\cdot 3}(.2)^3+\cdots\right]\\ &= 0.512+0.3072+0.12288+0.04096+\cdots.\end{aligned}$$

The values obtained from the tables check exactly with the sums of terms from the expansion.

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MATHEMATICAL EDUCATION NOTES

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THE CUPM CATALOG SURVEY

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1. Background. About five years ago, the Division of Mathematics of the National Research Council, with support from the National Science Foundation, initiated a survey of Research Potential and Training in the mathematical sciences; the findings, commonly referred to as the Albert Report, were issued in 1957 and include a study of the research activities of about 1500 mathematicians, and a cross-sectional study of the organization and mathematical environment of about sixty universities offering training in mathematics at the doctorate level. Copies of the Albert Report may still be available from the Providence office of the American Mathematical Society.

As part of its general study of mathematics programs, the Committee on the Undergraduate Program is presently carrying out an extension of the 1955–57 survey with a different and somewhat larger sample of colleges, principally representing those that do not offer a doctorate program in mathematics. This survey is being carried out with the assistance of the National Opinion Research Center at the University of Chicago. As a guide in the design of this survey and to provide certain information which we felt was needed, CUPM asked one of its members, Professor Mosteller of Harvard, to supervise an examination of the mathematical listings in a stratified sample of 300 college catalogs. The complete report, prepared by Frederick Mosteller, Keewhan Choi, and Joseph Sedransk, may be obtained by members of the Association by writing to Professor R. J. Wisner, Michigan State University Oakland, Rochester, Michigan. The present note is intended to summarize the findings from this survey.

2. **Summary.** In attempting to draw conclusions from the data that result from an examination of catalogs, it is important to keep three points in mind: (i) a catalog description of a course may not be a faithful description of the course that was actually given, (ii) the available catalog may be out of date, and thus not represent the *present* program of a college, (iii) the courses listed in a catalog may be given infrequently, if at all.

It is clear that the data resulting from the catalog survey may not give a true picture of the courses in mathematics that are currently being given in the nation's colleges; it may provide a measure of the courses that they think they *should* give. It is worth observing that remarks (i) and (ii) are perhaps less likely to apply to a small college. Since the study was concerned with the over-all picture rather than with the situation at any individual college, we have felt that there may be some interest outside CUPM in the results of the study.

An analysis of the structure of the sample will be found in the report itself. It included 216 of the listed 1147 regular four-year colleges, and 54 of the listed 414 junior colleges. It was stratified in many ways, taking into account such aspects as geographic location, size, and support; in terms of student body, it took in about 70% of the total college student body of the nation.

It is easiest to summarize the information about junior colleges first. Most are quite small, with enrollments less than 500, and they offer no advanced mathematics. Among the courses offered for credit, one is apt to see courses in elementary algebra, plane geometry, intermediate algebra, trigonometry, college algebra, analytical geometry, mathematics of finance, and even such courses as shop mathematics, industrial mathematics and slide rule. About a third of the junior colleges offer no course in calculus. A surprising discovery was that about 12% of the students attending junior colleges apparently have access to a course in computer programming; this is slightly more than have access to a course in the theory of equations.

Turning to the four-year colleges, we find an expectedly different pattern. Again, most of the colleges are small; about 80% have fewer than 3000 students, and only a handful have more than 7000 students. Although many of these also offer high school level mathematics courses, it is comforting to see that so many of these courses give no college credit.

Leaving the more detailed analysis to the report itself, the following brief comments may be of interest. About half of the colleges seem to offer something in the general area of modern algebra (e.g. algebraic structures, linear algebra, etc.). Until the results of the NORC survey are in, it is difficult to be more explicit about the nature and depth of these courses. The traditional theory of equations course (e.g. Dickson) is still available to about 50% of the total student body, often as the only course in algebra beyond college algebra. Those who are concerned about the *applied* vs *pure* debates will not be reassured by the discovery that about a third of the colleges offer no course in differential equations.

Some traditions die slowly; about a third of the colleges continue to offer separate courses in differential calculus and integral calculus, and about two-thirds offer a separate course in analytical geometry.

Textbook writers may give heed to the fact that about 75% of the colleges appear to give something called *advanced calculus*; judging however by course descriptions, most of these seem to be a continuation or completion of the elementary calculus course, and to lay no stress upon theory or upon modern aspects of analysis. Again, more detailed information on this point must await the completion of the NORC survey. In strong contrast to the junior college picture, only a tiny group of colleges (4%) offer no course in calculus.

A course in statistics is listed by about half of the colleges, but only about a quarter offer one with a calculus prerequisite and, as might be expected, these tend to concentrate among the larger colleges with more diverse programs. A course specifically in probability theory is much less likely to be listed, with or without a calculus prerequisite. On the other hand, courses in *finite mathematics* are burgeoning and are now apparently available to about 15% of the total student body.

To end this summary on a somewhat encouraging note, we note that 20% of the colleges list at least one *modern* course in at least three of the five basic areas—analysis, algebra, probability and statistics, geometry and topology, logic. The term *modern* is to be understood in a specific (charitable) interpretation explained more fully in the report itself. This group of colleges takes in about 50% of the total college population, showing the strong bias toward the larger schools. The representation of different areas of mathematics, however, is not uniform. A modern algebra course is available to 75% of the students, and one in probability or statistics to 60%, while each of the remaining fields reach about 40%.

For all additional details, the reader is referred to the detailed report; there he will find the list of courses used to code the catalogs, and the detailed tabulation of courses, either by colleges or by students, in a variety of different arrangements and subclasses.