ANALYSES OF PROCEDURES FOR ASSESSING CONTENT COVERAGE AND ITS EFFECTS ON INSTRUCTIONAL ASSESSMENT

CSE Technical Report 305

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September 1989

The research reported herein was conducted with partial support from the U.S. Department of Education, Office of Educational Research and Improvement, pursuant to Grant No. G0086-003. However, the opinions expressed do not necessarily reflect the position or policy of this agency and no official endorsement by this agency should be inferred.

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The conceptual and technical design of large-scale assessments that can better capture instructional effects has received considerable attention in recent years (e.g., Baker & Herman, 1985; Bock & Mislevy, 1988; Burstein, 1989; Burstein et al., 1986; Cole, 1988; Linn, 1987, 1989; Muthen, 1989; Muthen, et al., 1988; Traub & Wolfe, 1981). The focus of most of this work has been on improving either the quality and validity of subject matter tests as measures of instructionally influenced student achievement or the instructional sensitivity of the psychometric and statistical methods used to collect, analyze, interpret, and report test data.

One critical component in extending the validity and quality of large-scale instructional assessment and its use is the availability of auxiliary information about the instructional experiences of students (Burstein, 1989; Muthen et al., 1988). The main rationale for seeking information about instructional experiences is the belief that multiple, systematic factors (student ability, topic exposure, forms of instructional exposure) contribute to student performance as measured at a given point in time. Once this perspective is adopted, it follows that failing to incorporate information about these factors will likely compromise or weaken the validity of the assessments for the purposes for which they are intended. The question remains, however, whether it is feasible to validly assess instructional experiences in large-scale assessments and if it is, how the information will be used analytically to improve the validity of inferences regarding assessment results.

In much of the psychometric and statistical work in the area of instructional sensitivity to date, the assessments themselves have been the direct target of validation efforts and methodology developments, with data about instructional settings and experiences serving as part of the evidentiary and contextual process (e.g., test performance should be higher for students known to have been exposed to content or to have received "better" instruction). In the research reported below, the roles are reversed. We consider the validity of certain methods of gathering information about students' instructional experiences and will, in certain instances, view student test performance as corroborating evidence. The examination of this issue is a natural extension of our conception of the appropriate assessment of achievement (Burstein, Webb, Linn, & Muthen, 1987) and the direction of research and policy interest in instructional improvement and school reform (e.g., Burstein, 1987; Burstein & Guiton, 1984; McDonnell & Ormseth, 1989; Oakes, 1986; Shavelson et al., 1987; Shavelson, Webb, & Burstein, 1986).

The value of collecting information about instructional coverage as part of instructional assessment can be justified on several grounds. First, various forms of measuring content coverage have proven to be invaluable in the study of educational effects (cf., e.g., Berliner, 1980; Burstein et al., in press; Leinhardt & Seewald, 1981; Leinhardt, 1983; Schmidt, 1983; Shavelson et al., 1986). Measures of instructional coverage are important for evaluating the degree of match between tests and the subject matter experiences that students have had. Such measures are also needed to evaluate the sensitivity of test items to differences in the instructional experiences of individual students and of groups of students (Leinhardt & Seewald, 1981; Schmidt, 1983).

A second source of interest in information on instructional coverage is concerned with current efforts to develop comprehensive education indicator systems (CCSSO, 1984; Elliott & Hall, 1985; Hall et al., 1985; Oakes, 1986; Murnane & Raizen, 1988; Raizen & Jones, 1985; Selden, 1986; Shavelson et al., 1987) to monitor educational progress and aid in the assessment of school reform. Much of the literature on indicator systems contains general agreement that curriculum indicators will be a key component. The National Assessment of Educational Progress and the National Educational Longitudinal Study have substantially augmented their collection of instructional information to enhance indicator efforts in this area.

In the remainder of this paper, we will consider one method of assessing content coverage that we have employed in our research with data from the Second International Mathematics Study (SIMS) and the Mathematics Diagnostic Testing Program (MDTP). This examination will focus on data gathered from classrooms in which the MDTP tests were used. The method involved asking teachers to respond to questionnaire items that request

information about their content coverage practices for a series of topics representing the corpus of college preparatory secondary school mathematics curriculum (below calculus). This particular method of collecting information on content coverage has the virtue of being straightforward and comparatively efficient to collect. It also carries some relative advantages compared to other existing techniques. Although other methods—such as that used for the collection of the SIMS Opportunity to Learn information (OTL) (Burstein et al., in press; McKnight et al., 1987; Robitaille & Garden, 1988; Travers & Westbury, 1989), the detailed observational methods employed by Leinhardt and Seewald (1981), and the daily logs that were used to assess topic and instructional time in the Beginning Teacher Evaluation Study (Fisher et al., 1978)—are, in theory, more precise and valid for the assessment of actual curricular coverage practices than is our method, data collection for these methods requires considerably more time and resources. Another technique, employed by researchers at the Institute for Research on Teaching in their content determinants work (e.g., Schmidt, 1983), linked the inferences about content coverage too closely to analyses of textbooks rather than relying on teachers' statements about actual coverage. Although textbook analysis certainly is a reasonable means of determining content coverage, given the perceived heavy reliance on textbooks (especially in mathematics), any such analyses, when used as stand-alone information about content, are inherently insensitive to the variability that occurs in the emphasis employed by teachers using the same textbook.

If teachers faithfully and accurately respond to the questionnaire items about topic coverage and emphasis, then our technique becomes a viable means of assessing coverage, a technique that can be more or less fine-tuned, depending on the level of specificity (and corresponding respondent burden) in delineating topics. The present study is an exploratory attempt to investigate the viability of this method of assessing content coverage in the context of an ongoing examination of instructional assessment in secondary school mathematics.

MDTP Teacher Topic Coverage Questionnaire

In previous work on instructional assessment which used longitudinal data from the Mathematics Diagnostic Testing Program (MDTP), we developed and piloted a topic coverage questionnaire for teachers. The results of this work were reported in Burstein, Kim, and Chen (1988). The MDTP Teacher Topic Coverage Questionnaire (hereafter referred to as the topic coverage questionnaire) is somewhat unique in that it gathers in an efficient manner information about all mathematics courses taught by the teacher responding. Most previous studies of content coverage focused on a single targeted class (or the class in which a specific targeted student was enrolled) taught by the teacher. Our questionnaire could greatly expand the information base about instructional activities in cases where students are either exhaustively or randomly assessed within a school.

During 1988 the topic coverage questionnaire was refined to improve the precision of the information about topic coverage and to ask additional details about course focus. The questionnaire (Appendix B) was administered in operational form in late spring of 1988. The teacher questionnaire data and associated student data from the MDTP Algebra Readiness and Elementary Algebra tests and the so-called SIMS Benchmark tests, which contained a subset of the test items administered in the Second International Mathematics Study (Chen & Ruzicka, 1985; Robitaille & Garden, 1988; Travers & Westbury, 1989), served as the information base for the current investigation.

Design

The full design of the longitudinal study is a three-wave panel of the mathematics performance and instructional experiences of a sample of middle-school and secondary-school students whose teachers are participants in the MDTP program. These data are being gathered from sites (schools within districts) that are participating in a study of the longitudinal impact of MDTP. Schools from three districts participated in the present study. These sites were enlisted because of their high concentrations of minority students, a group for whom there is concern

that the MDTP program might be either especially effective or harmful, depending on strategies for local use. For the analyses considered here, the specific features of the implementation of MDTP within the schools are not a primary concern.

Subjects and Sampling

The specific subjects for this study were the teachers who volunteered to participate in the longitudinal study and the students from their classes who took the MDTP tests. Our analyses will concentrate on classes in which either the MDTP Algebra Readiness test or the Elementary Algebra test was administered. Too few teachers administered the Intermediate Algebra and Pre-calculus tests to include these tests in this phase of the investigation. The resultant data set can be described as follows:

Number of School Districts	3
Number of Schools	8
Number of Teachers	43
Number of Classes	176
Number of Students:	2179

The primary unit in the investigation was the class or section. Courses in which either the MDTP Algebra Readiness test or the Elementary Algebra test were classified into five categories on the basis of course type and textbook information provided by the teacher. The categories, the resulting number of sections of each, and the number of students for whom complete information was provided are indicated below:

1. Lower than Pre-Algebra: General math, Grade 7 and 8 math, refresher math; 43 sections, 344 students
2. Math A or Math B: Newly developed courses intended to serve as an alternative to First-Year Algebra for re-entry into college preparatory mathematics; 20 sections, 210 students
3. Pre-Algebra: 39 sections, 594 students
4. First-Year Algebra: 32 sections, 556 students
5. Geometry: 22 sections, 288 students

Instrumentation

The topic coverage questionnaire was designed to gather auxiliary information about mathematics teaching within the context of regular use of the MDTP. It was considered important to restrict the time demands on teachers to no more than 30 minutes. Given this constraint, the decision was made to focus questionnaire items on the topics that were covered, whether they were taught as new material, extended, or reviewed, and if not covered, the reasons why (options for the latter were "Prerequisite," "Taught Later," "Not Part of the Curriculum," "Don't Know"). The actual response alternatives were variations of the response options from the SIMS Opportunity to Learn questions and their topic-specific teacher questionnaires. Versions of this questionnaire were also used in the CRESST/RAND School Reform Assessment project and are being used in the field test for the 1990 Follow-Up of the National Education Longitudinal Study conducted by NORC for the National Center for Education Statistics.

The topics incorporated in the present version of the questionnaire were those identified as included in any of the four MDTP tests or in the secondary school mathematics grid developed as part of an earlier study of the content validity of MDTP tests (Burstein et al., 1986). Thus, the questionnaire was expected to span the course material for college-preparatory secondary school mathematics, which necessitated the compilation of an extensive list of topics (97 topics classified into 12 distinct subgroups; see below). Additionally, the instrument elicited information about the course title, periods taught, grade levels, type of class (remedial, typical/regular, or advanced/honors), text, and range of material covered (very wide,

fairly wide, fairly narrow, or very narrow; note: this question is being replaced by one asking for the textbook chapters covered).

The subgroups for classification of the 97 topics were:

1. Integers (4 topics)
2. Fractions, Decimals, Ratio, Proportion, and Percent (14 topics)
3. Exponents, Radicals, and Square Roots (14 topics)
4. Polynomials (12 topics)
5. Algebraic Equations (11 topics)
6. Inequalities (3 topics)
7. Rational Expressions (4 topics)
8. Probability and Statistics (2 topics)
9. Geometry (15 topics)
10. Absolute Value (2 topics)
11. Functions (10 topics)
12. Trigonometry (6 topics)

Note that the number of topics in each subdivision was not intended to reflect its overall importance in the mathematics curriculum. The subgroups were uneven in their level of specificity (this also applies to topics): Algebra dominated in terms of the number of subgroups and topics devoted to it; geometry received more limited representation. The absence of an MDTP test devoted exclusively to geometry placed some constraints on its representation in the topic coverage questionnaire.

For each topic and course, the teacher was asked to respond to the question, "...indicate ...how the topic was covered in each course," by selecting from the following options:

A. "New": Taught as new content.
B. "Extended": Reviewed and extended.
C. "Review": Reviewed only.
D. "Assumed": Assumed as prerequisite knowledge and neither taught nor reviewed.
E. "Taught Later": Taught later in the school curriculum.
F. "Not in Curriculum": Not in the school curriculum.
G. "Don't Know": Not taught now and don't know if it's in the school curriculum.

Conceptual Framework for Analyzing Patterns of Topic Coverage

In considering the data from our topic coverage questionnaire, it is important to keep in mind that our purpose was to examine the validity of this type of topic coverage questionnaire as a means to assess content coverage. There is no explicit operational standard for judging whether this method works. Rather, we were looking for patterns of responses that should align with logical expectations about the contents of a course with a given title and student clientele. Three types of evidence would seem pertinent here. First, we expect to see indications that teachers were teaching topics that typically are believed to be associated with a given course. For instance, First-Year Algebra courses should cover predominantly algebra-related topics, and Geometry courses should be heavy in topics from that subgroup. When a topic clearly aligns with a given course, virtually all teachers claiming to teach that course should state that the topic is taught as New content (Response A) or perhaps as Extended content (Response B).

Second, we should not find responses that are inconsistent with the course. For example, we should not see responses indicating that common and decimal fractions are being taught as new topics in First-Year Algebra or Geometry or, conversely, that classes lower than Pre-Algebra tend to teach algebra and higher level geometry topics. Any indication that teachers were reporting such activities would reflect negatively on the accuracy and validity of the questionnaire responses.

The third type of evidence is perhaps more subtle. It involves response patterns within the broader topic categories examined within and between course categories. These patterns should be consistent with logical development of the topic and its place within the curriculum of a given course. Take, for example, the topic Algebraic Equations. Given typical notions of the topic, there is a logical hierarchy such that students should be introduced to simple linear equations in one unknown with numerical or literal coefficients (subtopics 45-47) before they are introduced to quadratic equations (subtopics 53-55). This order of coverage would hold within a course where all subtopics are likely to be taught (e.g., in First-Year Algebra) and across courses (e.g., linear equations might be introduced in Pre-Algebra, but quadratic equations would not be). There should be no idiosyncrasies in the response patterns; that is, topics that logically build upon earlier topics should not be taught more often than the prerequisite topics.

Clear, logically based designations of where all topics should be taught is not feasible given current conditions in lower secondary-school mathematics. Prevalent themes in discussions about reforming the mathematics curriculum are the concern for the "flat spiral" that is evident in the repetition of certain topics and the lack of intensity of instruction on the topics that are covered (e.g., Mathematical Sciences Education Board, 1989; McKnight et al., 1987; National Council of Teachers of Mathematics, 1989; Romberg, 1988). Therefore, we should not be surprised to find (a) differences across sections of the same course in the specific topics covered and (b) that some topics linger (in the sense that they are taught, extended, and reviewed) across a number of different courses. Moreover, certain topics are likely to have no consistent home in present course offerings; probably the best example of this is the treatment of probability and statistics in the courses considered below.

In essence, then, the search for evidence regarding the validity of the content coverage questionnaire must be carried out across topics and between and within courses. It involves consideration of such matters as consistencies versus inconsistencies, concentrations of coverage versus dispersion, and hierarchical versus non-hierarchical patterns of coverage.

Patterns of Responses to MDTP Teacher Topic Coverage Questionnaire

Topic Coverage within Course Types

The first sets of analyses of the teacher data focused on the actual teacher responses regarding their topic coverage. Raw frequencies of responses (topic by type of coverage) were tabulated for course sections assigned to five categories (Lower than Pre-Algebra, Math A or Math B, Pre-Algebra, First-Year Algebra, Geometry). The results are reported in Figure 1. Note that in addition to raw tabulations of actual responses, certain combinations of responses (e.g., Taught [A + B +C], Taught + Extended [A + B], Extended + Review [B +C], Not Taught and Not Assumed [E + F + G + Missing]) were also tabulated. These represent possible reconfigurations that could be considered broader and possibly more reliable (in the sense of accuracy of teacher reporting and interpretation of terminology) than the current categorizations of response choices.

As portrayed in Figure 1 (see Appendix A), these frequency data can be used best to characterize the apparent topical emphases in given courses and whether these emphases vary across sections of the course. We will consider the patterns first on a course-by-course basis.

Lower than Pre-Algebra. This course category, which contained 43 course sections, is perhaps the most diverse to be considered since it included typical mathematics classes for middle-school students and the mathematics courses at the high school level that were not considered college preparatory. As such, one might expect topic variability across sections in certain topics.

Overall, the response patterns were sensible (and to a certain degree, discouraging). The curriculum of the courses in this category comprised "higher level" arithmetic, regardless of the grade level of the students. Virtually nothing was assumed to have been taught prior to the course, and the vast majority of the topics were judged either to be Taught Later or Not in the Curriculum. In virtually all sections, operations with common and decimal fractions and ratio, proportion, and percentage problems were taught as New or Extended. There were no other subtopics where the number of responses in the combined "not taught" category (E + F + G + Missing)[1] was less than 11 (or roughly 25% of the sections). Topics that showed considerable divergence in coverage across sections (as evidenced by concentrations of teachers in the combined Taught/Extended and the combined Taught Later/Not in Curriculum response categories) included the following: (a) all subtopics in the integers subgroup; (b) laws of exponents, scientific notation, and introductory square root concepts in the exponents subgroup; (c) simple linear equations with one unknown and either numerical or literal coefficients under algebraic equations; (d) probability; (e) descriptive statistics; and (f) introduction to coordinate systems, perimeter, area, circumference, volume problems with plane figures, angular measurement and properties of triangles under the subgroup geometry.

Math A and Math B. As mentioned earlier, this course (or course sequence) is part of the new California Mathematics Framework which offers alternatives to the traditional pre-algebra/first-year algebra routes to re-enter intermediate and upper level college preparatory secondary-school mathematics. The state-wide implementation of this course is in progress. On the basis of our data from 20 course sections, the topic boundaries for the course were not very rigidly defined other than that most of the topics in our integer and fractions categories and the laws of exponents were covered. Students in certain sections (roughly one-third to one-half of the sections) purportedly were studying scientific notation, square roots, introductory polynomials, algebraic equations, inequalities, and rational expression topics, probability, and descriptive statistics; their counterparts in other sections studied these topics later in the curriculum.

Pre-Algebra. As with the previous course types, virtually nothing was assumed in Pre-Algebra, and many topics were never taught at this level. Virtually all of the 39 sections of this course in the combined Taught/Extended (A + B) category (30 sections or more sections indicating taught or extended) covered the following subtopics: (a) integers (signed number operations, prime factorization, distances on the number line); (b) fractions/RPP (all ratio, proportion, and percentage subtopics); and (c) exponents (laws of exponents, scientific notation, integral exponents, square roots with perfect squares).

Two other patterns occurred with sufficient frequency to warrant mention. The first pattern distinguished what appeared to be lingering teaching of topics introduced earlier in the curriculum (Responses A and B) from Review Only (Response C). This was true of the remaining subtopics under integers and fractions/RPP (essentially the common and decimal fraction subtopics) and the subtopics under geometry that dealt with the properties of plane figures.

The second pattern reflected diversity across sections either in the extensiveness of the Pre-Algebra curriculum or simply in its content. Subtopics with significant numbers of sections (at least 10 sections) in which a topic was taught and also significant numbers of sections in which the topic was to be taught later or not taught included the following: (a) exponents (operations with square roots, operations with radical and rational expressions—Subtopics 23-29); (b) polynomials (introductory topics—Subtopics 33-37); (c) algebraic equations (simple linear equation topics—Subtopics 45-51); (d) inequalities (one unknown with numerical coefficients, graphing linear equations in one unknown rational expressions—all topics); (e) probability; (f) descriptive statistics; (g) geometry (angular measurement, properties of triangles,

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[1] In this instance, most of the responses that were missing reprinted instances where teachers stopped responding after what they judged to be the pertinent topics for a course.

parallelism and perpendicularity); (g) absolute value; and (h) trigonometry (finding algebraic expressions, describing variations of function).

The picture of Pre-Algebra that was drawn from the questionnaire responses was one of diversity of topic coverage, with some teachers treating it as a beginning algebra course that offered light introductions to topics in First-Year Algebra, and others considering it to be perhaps the final opportunity to make sure that all arithmetic topics and routine geometry topics were well understood.

First-Year Algebra. The reports on topic coverage for First-Year Algebra course sections depicted considerable homogeneity in coverage of the categories that represent the core of introductory algebra (exponents, polynomials, algebraic equations, inequalities, rational expressions, absolute value). In fact, within these topic categories, the only subtopics having as many as 8 sections (out of 32) that were reported as Taught Later (Response E) were graphing quadratic relations and solutions of quadratic inequalities. The only topics outside this algebra core to achieve this level of coverage (A + B) were prime factorization, topics involving proportions, graph reading, coordinate system, area and perimeter, and introduction to the function concept and function notation. In most of these cases, the mixture of Taught as New versus Extended responses was roughly even, especially for the integer and fractions/RPP subtopics. In contrast, virtually all responses in the algebra topic areas were Taught as New.

The topics that appeared to differentiate First-Year Algebra course sections again were divided into those that reflected time devoted to extending or reviewing common and decimal fractions versus those that were indicative of enriched preparation for future courses. Among the latter were selective teaching of topics in geometry and more extensive introductions to functions. This was the first course in the set under consideration in which there was a considerable number of sections in which certain topics were assumed (largely common and decimal fractions and selected geometry topics).

Geometry. The pattern of response from the 22 Geometry sections was what might be anticipated, given our discussion of the other course types. Responses indicated that, essentially, a core of geometry topics was universally taught (every subtopic under Geometry was covered except transformations and vectors). There also was evidence of differentiation among sections in whether certain high-level arithmetic topics were reviewed (and perhaps extended) or assumed as prerequisite knowledge. Some teachers revisited the algebra core, typically extending or reviewing these courses, while others assumed it as a prerequisite and perhaps introduced special topics from the geometry/trigonometry parts of the curriculum (transformations, vectors, finding side lengths in special triangles). Topics that were covered in the more advanced of the First-Year Algebra classes (e.g., functions) were not likely to be taught in Geometry. Apparently, "invisible" boundaries, perpetuated by historical separations of introductory courses for college-bound students in secondary-school mathematics curriculum, were maintained in the classes participating in our study.

Topic Coverage across Course Types

The discussion of the results shown in Figure 1 highlights the tendency of the teacher responses to be consistent for the most part with expectations about specific courses (e.g., Pre-Algebra, First-Year Algebra, Geometry). The indications of diversity in coverage within a course type were consistent with the notion that variability in topic coverage across sections of the same course is a reflection of the tradeoffs that teachers make between time devoted to enriched or advanced topics and that spent reviewing and extending material covered earlier in the curriculum.

Two additional sets of tabulations were generated to depict shifts in emphasis for given topics and subtopics across courses. We had hoped to see that although topics might linger across courses, the patterns of responses were consistent with expectations about their place within the mathematics curriculum. Here the shift from Taught Later to Taught as New to Extended to Review to Assumed as Prerequisite ought to have been evident for the majority of

subtopics and topics across the course types. There should have been peaks in coverage associated with the courses where topics represented the primary material (for instance, the algebra and geometry topics in the corresponding courses) with the percentage of sections covering a given topic falling off as the curriculum moved away from primary courses.

The data used to investigate these patterns were topic-by-topic (12 categories) and subtopic-by-subtopic (97 categories) tabulations of the percentages of sections within a given course type in which teachers chose each response option. The combinations of response options considered earlier were used here as well. In the figures, the percentages associated with each of the five course types are presented separately for each topic and subtopic. The tabulations at the topic and subtopic levels are presented in Figures 2 and 3, respectively (see Appendix A).

Our discussion of these data will be primarily at the topic level. There also is some advantage to further bundle topics into groups that might be expected to comprise the core material for three of the courses: (a) Pre-Algebra (integers, fractions/RPP); (b) Algebra (exponents, polynomials, algebraic equations, inequalities, rational expressions, absolute value); and (c) Geometry curriculum plus residual topics that either are not located firmly in the curriculum (probability, descriptive statistics) or are primarily associated with advanced coursework (functions, trigonometry). The discussion of subtopic-level data will indicate whether topic-level averages are masking anticipated or unanticipated subtopic variability in patterns.

Pre-Algebra core. The pattern of response clearly pointed to the subtopics in integers and fractions/RPP as being the primary material in courses below First-Year Algebra. The integer topics were Taught as New, Extended, or Reviewed (in that order) in virtually every Math A or Math B and Pre-Algebra course. The subtopics involving operations with signed numbers and a number line also were standard fare in the Lower than Pre-Algebra and First-Year Algebra courses, and prime factorization was almost universal in the latter course.

The pattern of response for the fraction/RPP topic indicated that although the subtopics were virtually universal before First-Year Algebra (and very prevalent in that course as well—note the monotonic decline in the percentage of A + B across courses in Figure 2), the method of instruction varied from course to course. In no course was the average percentage of teachers claiming to teach this topic as new greater than 50%. Moreover, to a certain extent the overall percentages masked (a) subgroupings of the common and decimal fractions topics; (b) the conversions among fractions, decimals, and percentages; and (c) the ratio, proportion, and percent problems. With respect to fractions, virtually all Pre-Algebra classes extended and reviewed the topic; these subtopics were assumed in about half of the First-Year Algebra and Geometry sections. Conversion problems were primary instruction topics for the Lower than Algebra and Math A and B sections, and extension and review topics for Pre-Algebra; they increasingly became assumed in First-Year Algebra and Geometry. On the other hand, ratio, proportion, and percentages were apparently taught in fewer than half the sections below Pre-Algebra, virtually all sections of Pre-Algebra and First-Year Algebra, and were extension or review topics in about two-thirds of the Geometry classes. A very small percentage of teachers assumed that this material was previously taught.

Algebra core. For the most part, the pattern of response was consistent with the notion that most of the topics in the exponents, polynomials, algebraic equations, inequalities, rational, expressions, and absolute values categories were First-Year Algebra topics. None of these topics were indicated as Reviewed (Response C) in First-Year Algebra (or in lower level courses) and for most subtopics the overwhelming majority of First-Year Algebra teachers described them as New.

Exponent, square root, and absolute value topics were taught as new in a majority of Pre-Algebra classes, but virtually none of the remaining topics made more than a token appearance prior to First-Year Algebra. All algebra topics tended to disappear from the

curriculum in Geometry courses, except for those that offered some review (about one-third to one-half of the classes for some topics).

The patterns of response for two subtopics were sufficiently distinctive to warrant comment. Simplification of complex numbers (Topic 44) was classified under polynomials. This topic was viewed primarily as an intermediate algebra topic in the MDTP testing framework. The same was true for graphing quadratic equations (Topic 55), classified here under algebraic equations. For both of these subtopics, the percentage of First-Year Algebra teachers who claimed to teach the subtopic was considerably lower than those claiming to teach other subtopics in the same category: 30-40% lower than the immediately preceding topic in the category (Figure 3). There was still a considerable number of teachers (approximately 60%) claiming to teach the topic. Given where the topic falls in the curriculum, this relatively high level of coverage in this course is not very believable. Apparently about 20% to 30% of the Geometry teachers assumed that this material had been taught previously. Another 20% of the Geometry teachers claimed to review these topics. If the Geometry teachers are to be believed, then the reported coverage in First-Year Algebra may be as high as 10% (at most). However, experience would suggest that levels reported by both groups of teachers were unnaturally high. We think that teachers may have responded mechanically, rather than evaluating each topic on its own merits, which may have affected the response patterns on these topics.

Geometry core. If our data are to be believed, the subtopics in Geometry represented a mixed picture. Coordinate plane and measurement formula subtopics showed up in some fashion in virtually all Pre-Algebra classes and in most First-Year Algebra and Geometry classes. The properties of triangles topics appeared in about half of the Pre-Algebra classes, virtually disappeared during First-Year Algebra, and then were taught as new in virtually all Geometry classes. Formal proof was taught exclusively in Geometry; transformational geometry and vectors topics were claimed as covered in about one-third of the Geometry classes. With the exception of the purported prevalence of transformational geometry and vectors, the results were consistent with expectations about Geometry's place in the curriculum.

Probability and Descriptive Statistics. Judging from the responses, probability and descriptive statistics were the mathematics curriculum's "homeless." With the exception of probability for Math A or B, the majority of teachers claimed that this topic would be taught later or was not in the curriculum, or stated that they didn't know whether it was in the curriculum. These topics evidently were not construed to belong in First-Year Algebra or Geometry, or in courses lower than Pre-Algebra. This topic is an intended topic for the Math A or B courses (perhaps) and some Pre-Algebra teachers reportedly devoted time to it. Given recent developments regarding the reform of mathematics curricula (e.g., Mathematical Sciences Education Board, 1989; NCTM, 1989), this pattern of results was not unexpected. Whether the proposed reforms will lead to changes in the pattern remains to be seen.

Functions and Trigonometry. The remaining topics, functions and trigonometry, were viewed to be material primarily for the courses that would use the MDTP Intermediate Algebra and Pre-Calculus tests; in other words, upper level coursework. Except for some results already noted with regard to (a) the concept of functions in First-Year Algebra and (b) finding the lengths of special triangles using trigonometric properties in Geometry, there was virtually no coverage of subtopics in these categories. These results suggest at least that teachers were not claiming to teach topics that were not in the curriculum.

Association Between Test Performance and Reported Topic Coverage

The descriptive results of what teachers claimed to teach at various levels are interesting in and of themselves. However, the question that motivated their development was whether teacher-provided topic coverage information was a valid means of assessing content coverage and how one might proceed to investigate the validity of such data. As a next step, we decided

to ascertain whether the specific response choices corresponded in a systematic way with performance on the MDTP and SIMS Benchmark test items that measured a given subtopic.

Description of Test Data

The three tests administered to students in the courses considered in this study were the MDTP Algebra Readiness and Elementary Algebra tests and the six short forms of the A level of the SIMS Benchmark tests. The SIMS tests contained 46 items selected from the pool of SIMS items administered at Grade 8. These items were distributed among the six forms. Two items were common across all forms, and the remaining items were allocated to achieve a rough balance among the forms in content and difficulty (using SIMS performance levels as a guide regarding the latter). Depending on the course in which students were enrolled, they would have taken either the MDTP Algebra Readiness test (Lower than Pre-Algebra, Math A or B, Pre-Algebra) or Elementary Algebra test (First-Year Algebra, Geometry) and one of the six randomly assigned forms of the SIMS Benchmark test. In the analyses to be reported below, approximately 455 students in Lower than Pre-Algebra, 324 students in Math A or B, and 821 students in Pre-Algebra took the MDTP Algebra Readiness test. The data from the Elementary Algebra test came from 823 First-Year Algebra students and 379 Geometry students. The results from the SIMS Benchmark tests were based on 447 students in Lower than Pre-Algebra, 289 students in Math A or B, 763 students in Pre-Algebra, 782 students in First-Year Algebra, and 350 students in Geometry, with the students in any specific course distributed roughly equally among the six forms (e.g., 128, 126, 130, 133, 149, and 125 students taking Forms A1 to A6, respectively, in First-Year Algebra).

Performance levels. Although we are not directly interested in student performance on the tests in and of itself, some brief comment about overall performance levels and patterns seems warranted. The median p-value for the 50-item MDTP Algebra Readiness test was only .32, with a high of .71 and a low of .12 (toward the end of the test). There was a monotonic relationship across all test items between p-values and course type, with Pre-Algebra students performing higher than Math A or B students who in turn did better than the Lower than Pre-Algebra students. The median p-value for the MDTP Elementary Algebra test was .35, with a low of .14 and a high of .74. However, for this test, First-Year Algebra students actually scored higher on most items than Geometry students. The exceptions tended to be found in word problems and in the content area that the MDTP specifications call geometric measurement. These patterns suggested that the recency of topic coverage affected performance levels: Most geometry students did not receive much instruction on the primarily algebra-oriented content of the test. Although MDTP does not publish or otherwise report statewide averages of any type or over any time period, one study produced enough incidental evidence to suggest that the performance levels in the sampled classrooms (see earlier description of the sample) were low in comparison to more typical MDTP results.

For the SIMS Benchmark test items, the median p-value in our sample was .40, with a low of .14 and a high of .74. The corresponding results from the actual 1981-82 pretest and posttest administrations of SIMS (taken from Chang & Ruzicka, 1985) were .325 (low=.10; high=.77) for the pretest and .44 (low=.12; high=.76) for the posttest. Considering that SIMS was administered only to Grade 8 students and that more than half the data reported in this paper came from students in Grades 9 and above (40% of whom were in either First-Year Algebra or Geometry; c.f. the percentage of students taking SIMS who were in Algebra —12%), the performance level of students in our study sample was relatively low.

Assignment of test items to topics and topic coverage categories. Items from the MDTP Algebra Readiness and Elementary Algebra tests were assigned to topics according to the scheme reported in Burstein, Chen, Qi, and Kim (1986).[2] The same procedure was employed to classify the SIMS Benchmark items into the categories from the topic coverage

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[2] This scheme was derived by modifying MDTP test specifications to arrive at a potentially manageable number of topics for the questionnaire. In the 1986 study, MDTP items were classified into the SIMS categorization scheme, but not vice versa.

questionnaire. Two members of the project staff independently classified the items and then resolved disagreements. Certain of the items did not fall readily into the MDTP classification scheme; these are not considered in the analysis that follows. The actual item assignments to topics from the questionnaire are reported in Appendix C.

Performance data on the MDTP and SIMS Benchmark tests were then matched with teacher data, and p-values were calculated for each item where students were grouped in accordance with their teachers' responses to the topic coverage questions. The p-values for individual items were then averaged across items for which at least one teacher chose the particular response alternative. Thus, the resultant p-values were averages over students and items that teachers claimed to have taught in a certain way. Specific topics emphasized were not considered in this comparison; rather, attention was given only to the way in which a teacher claimed to teach topics.

Results

The resulting p-values and the number of test items on which they were based are reported in Figure 4. The results generally were encouraging but not overwhelming. Looking first at the two MDTP tests, the categories Taught as New and Assumed as Prerequisite had the highest average p-values on both tests. Taught Later, Don't Know, and No Response categories had lower average p-values on both tests; the Extended and Reviewed and Reviewed Only categories fell in the middle. The Not in the Curriculum response appeared to be sending mixed signals on these two tests. For the Algebra Readiness tests, performance on items identified as Not in the Curriculum was quite high; for the Elementary Algebra test, the performance was very low. However, these apparent differences were anomalies: Very few teachers (typically no more than 1 or 2) chose Not in the Curriculum for any one item, so the p-values were not very stable for this response alternative.

For the SIMS Benchmark items, the simple rank ordering of average p-values appeared more confusing because of the high values for Don't Know. However, only one teacher chose Don't Know for 13 of the 15 items falling into this response category. Here again, the data were not trustworthy because of the limited number of responses. Otherwise the patterns of performance were associated with response alternatives in expected ways, with a difference of roughly .03 that encompassed all four of the taught or assumed options and a separation of at least three times that much indicated between those four response alternatives and the non-response and the two not-taught (Not in Curriculum, Taught Later) categories. Clearly, when sufficient data warranted some confidence in performance data, the patterns of performance associated with given response options were roughly those that were expected.

Summarizing the Evidence: The Viability of Response Choices

We have considered in some detail the patterns of response to the content coverage questions and their relationships to performance levels on the test items from the three tests used in the study. Looking at the responses as a whole, the results were largely consistent with what might be the expected curriculum patterns in mathematics courses at these levels. There was certainly no evidence of any egregious misrepresentation of what might have happened in a given class or course, although some minor indications of possible overstatement of coverage (e.g., simplification of complex numbers) were apparent. The likely sources of these discrepancies were teachers' misinterpretation (or alternative interpretations) of the topic descriptors and failure to respond faithfully to each topic as if it were the only one asked (the topics that had the most notable discrepancies were the last subtopics in long sections).

All in all, the evidence thus far suggests that the type of topic coverage question asked and the form in which it was asked appeared to "work" in the sense that it produced results that might have been anticipated. The only drawbacks seemed to be associated with the total number of topics administered and perhaps the wording of various topics. With respect to the former, we did notice (but haven't mentioned thus far) that certain subtopics tended to cluster

in the responses they elicited. This occurred, for example, with the two subtopics on arithmetic operations with fractions and decimals and with subtopics from algebraic equations on solving equations with two linear equations with two unknowns by elimination and by substitution. In these cases, the presence of identical instruction methods was logically possible and probably likely, although some degree of response set also could have been involved since the subtopic pairs appeared contiguously in the questionnaire. In situations where response burden is a concern, it would seem reasonable to collapse subtopics that consistently appear to be covered in the same way as long as they are also "close" in the curriculum.

The question of wording of alternatives and collapsing response categories is a bit more complex. The boundaries between Taught as New and Extended and between Extended and Reviewed Only are fuzzy. Undoubtedly, teachers differed in their interpretation of how close these choices were to each other and what they meant. The data we have examined suggest that the boundaries between Taught as New and Reviewed Only were consistently applied. Material that was logically early in the curriculum did not appear as Taught as New in later courses; it was more likely to appear as Reviewed Only or perhaps Extended. Likewise, topics logically associated with more advanced courses were unlikely to evoke a response of Extended or Reviewed Only in lower level courses. Thus, the possibly floating meaning of Extended is potentially troubling.

Resolution of the vague, or floating, boundary problem with respect to these three options is possible only in a context-specific way. Resolution depends on the topics and also on their logical location within the curriculum and the set of courses (and their clientele) under consideration. In some of the interpretations we provided earlier, we implicitly collapsed response choices when the resulting patterns were made clearer (in our view) by doing so, but we didn't always collapse in the same way. Others might see things differently. We do believe, however, that it proved best to start with the three distinct, plausible categories of coverage that we have used here, since any a priori decision for collapsing would yield flawed results in most circumstances.

Among the response alternatives that could be construed as representing "not taught in this course," the meanings of Assumed as Prerequisite and Taught Later seemed most straightforward and behaved accordingly in our data. Depending on when a topic coverage questionnaire was administered during the academic year, Taught Later referred either to later during this course or to later in future courses. Presumably, investigators who choose to use this response alternative will be prepared to deal with the resulting ambiguity.

The response alternatives Not in the Curriculum and Don't Know were potentially problematic, but for different reasons. Often Not in the Curriculum was interpreted as "not taught during this course." With respect to virtually every topic, the tendency was for teachers from the lower level courses to choose this option if anyone did. It seems unlikely that such response tendencies would be attributable to beliefs that the referent topics were not in the curriculum at all, but rather that they were taught later or that the teacher simply didn't know whether they were taught later. For certain higher level topics (absolute value, functions, trigonometry), pockets of Geometry teachers responded Not in the Curriculum. Surely these teachers realized that these topics appeared in the curriculum somewhere—the question was where.

The response Don't Know should have been interpreted literally—that is, the teacher didn't know whether a topic appeared in the curriculum. Overall, less than 2% of the responses were Don't Know, and in most cases, these respondents taught courses that held an earlier place in the curriculum than those in which the topic was most prevalent. These teachers simply may have been showing their lack of knowledge about higher level courses. The fact that the topics probability and statistics garnered the highest percentage of Don't Know responses (over 8% at the topic level) suggests that given the "curricularly homeless" status of the two topics, this response had some degree of face validity.

We had hoped that teachers would be able to make consistently the fine distinctions among the "not taught" choices, which we viewed to be logically appropriate. Based on our data, we are not very confident that they did. The most ambiguous response was Not in the Curriculum, for which several conceptually distinctive interpretations apparently were made. Once again, however (as with the Extended response discussed earlier), collapsing alternatives a priori may not be a wise course of action since the ambiguity seems to be connected to contextually specific explanations rather than an apparent generalized misconstrual of meaning. Although the location of incorrectly chosen Not in the Curriculum responses is often obvious, the time at which one might choose to adjust specific responses is much less so.

Concluding Comments

In this study, we set out to explore the viability of using teachers' questionnaire responses regarding their teaching of a list of mathematics topics as a means of assessing content coverage. Our notion was that such methods could be efficiently employed in standard and routine ways to obtain content coverage measures and perhaps could serve as curriculum indicators or as auxiliary information to use in the analysis and interpretation of instructional assessment data.

We conclude that collecting content coverage information under the circumstances used here yields plausible information about content emphases in instruction, as long as the burden for precision is not too heavy. That is, the patterns of response are potentially realistic portrayals of coverage for categories of courses and topics at certain levels of specificity, but the quality of the fit degrades if distinctions in either course type or subtopic become too fine-grained. Moreover, in our view it is the relative prevalence of a given topic in a given course rather than the absolute levels of coverage that is most trustworthy. So, strict reliance on the estimated proportions of coverage for any given topic or course is likely to be misguided, if for no other reason than that the boundaries among response alternatives appear to vary across course levels and may depend on the specificity and clarity of topic descriptions as well as on individual differences among teachers in their use of the response scale.

There are a variety of loose ends that we might pursue at this point to clarify further the functioning of this form of content coverage assessment and how it might be improved and used. One question that comes to mind is whether the distinctive topic coverage patterns noticed in certain course types (e.g., lingering coverage of higher level arithmetic versus advanced topics in First-Year Algebra) can be examined more closely. Perhaps distinctive subclusters of teachers within course types stick to that course's core, while other clusters represent the "reviewers" and the "accelerators." This situation would turn the data into a possible means of assessing teaching practices rather than curriculum coverage per se, but it might enhance our ability to account for between-class variation in topic-level performance. One also might consider more carefully the question of curriculum quality as measured by the rigor or remedial nature of the content covered in specific classes and how data of this sort might be translated into indicators of these attributes of a class or school's course offerings.

Clearly, gaining new insight into the functioning of teachers' questionnaire responses about content coverage has merit. Because such information has a role in the assessment of the impact of educational reforms, attempts to examine and monitor instructional practices will remain an important topic in the current climate of reform. These attempts hold potential and promise, but one question remains: How much faith can we place in seemingly simple assessments of content coverage of the type considered here, and can we be confident of the results?

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APPENDIX A

Figure 1

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
RAW FREQUENCIES OF RESPONSES

COURSE	TOPIC	SUBTOPIC	NEW	EXTENDED	REVIEWED	ASSUMED	TAUGHT LATER	NOT IN CURRI	NOT KNOW	MISSING	A+B+C	A	B+C	A+B	C	D	E+F+G+M
			A	B	C	D	E	F	G	M							
LOWER THAN PRE-ALGEBRA	1. INTEGERS	BASIC OPERATIONS WITH SIGNED NO.	12	17	3	.	10	1	.	.	32	12	20	29	3	.	11
		PRIME FACTORIZATION	13	12	3	2	13	.	.	.	28	13	15	25	3	2	13
		FINDING DISTANCES ON NUMBER LINE	16	12	3	.	9	.	1	2	31	16	15	28	3	.	12
		USING DEFINITION OF DIVISIBILITY	10	20	1	.	11	.	.	1	31	10	21	30	1	.	12
	TOPIC TOTAL		51	61	10	2	43	1	1	3	122	51	71	112	10	2	48
	2. FRACTIONS	ADD. & SUB. OF FRACTIONS	12	24	7	.	.	.	.	.	43	12	31	36	7	.	.
		MUL. & DIV. OF FRACTIONS	12	24	7	.	.	.	.	.	43	12	31	36	7	.	.
		ORDER & COMPARISON OF FRACTIONS	12	24	7	.	.	.	.	.	43	12	31	36	7	.	.
		SIMPLIF. OF COMPLEX FRACTIONS	12	20	5	.	4	.	.	2	37	12	25	32	5	.	6
		ADD. & SUB OF DECIMALS	12	25	6	.	.	.	.	.	43	12	31	37	6	.	.
		MUL. & DIV. OF DECIMALS	12	27	4	.	.	.	.	.	43	12	31	39	4	.	.
		ESTIMATION & APPROXIMATION	17	21	3	.	2	.	.	.	41	17	24	38	3	.	2
		CONV. BET. FRACTIONS & DECIMALS	20	18	3	.	2	.	.	.	41	20	21	38	3	.	2
		CONV. BET. FRACTIONS & PERCENT	20	18	3	.	2	.	.	.	41	20	21	38	3	.	2
		COMPUT. WITH DECI & FRAC, ROUND.	20	18	5	.	.	.	.	.	43	20	23	38	5	.	.
		COMPUTATION OF PERCENT	25	13	.	.	3	.	2	.	38	25	13	38	.	.	5
		CONCEPT OF PROPORTION	26	9	1	.	5	.	2	.	36	26	10	35	1	.	7
		COMPUTATION OF PROPORTIONS	26	9	1	.	5	.	2	.	36	26	10	35	1	.	7
		APPLIC. OF RATIO OR PROPORTIONS	25	10	1	.	5	.	2	.	36	25	11	35	1	.	7
	TOPIC TOTAL		251	260	53	.	28	.	8	2	564	251	313	511	53	.	38
	3. EXPONENTS	APPLIC. LAWS OF EXPONENTS	12	10	3	.	12	2	2	2	25	12	13	22	3	.	18
		POWERS OF 10 & SCIENTIFIC NOTAT.	11	10	3	.	12	2	3	2	24	11	13	21	3	.	19
		EXPONENT. WITH INTEGRAL EXPONEN.	10	7	3	.	16	3	2	2	20	10	10	17	3	.	23

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COURSE	TOPIC	SUBTOPIC	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
	TOPIC TOTAL		39	17	.	.	268	132	.	60	56	39	17	56	.	.	460
LOWER THAN PRE-ALGEBRA	5. ALGEBRAIC EQU.	ONE UNKNOWN WITH NUM. COEFFI.	11	.	.	.	18	9	.	5	11	11	.	11	.	.	32
		ONE UNKNOWN WITH LIT. COEFFI.	10	.	.	.	19	9	.	5	10	10	.	10	.	.	33
		SIMPLE LIN. EQUA. IN ONE UNKNOWN	12	.	.	.	18	8	.	5	12	12	.	12	.	.	31
		TWO UNKNOWN BY ELIMINATION	4	.	.	.	23	11	.	5	4	4	.	4	.	.	39
		TWO UNKNOWN BY SUBSTITUTION	4	.	.	.	23	11	.	5	4	4	.	4	.	.	39
		APPLICATION OF EQUATIONS	7	.	.	.	20	11	.	5	7	7	.	7	.	.	36
		GENERATING EQUATIONS FROM DESCR.	7	.	.	.	20	11	.	5	7	7	.	7	.	.	36
		SOLV. EQUA. FROM FACTORED FORM	.	.	.	.	23	11	.	9	.	.	.	.	.	.	43
		SOLVING QUAD.EQUAT.BY FACTORING	.	.	.	.	23	11	.	9	.	.	.	.	.	.	43
		SOLV. QUAD. EQUA. BY QUADRATIC	.	.	.	.	23	11	.	9	.	.	.	.	.	.	43
		GRAPHS OF QUADRATIC RELATIONS	.	.	.	.	23	11	.	9	.	.	.	.	.	.	43
	TOPIC TOTAL		55	.	.	.	233	114	.	71	55	55	.	55	.	.	418
	6. INEQUALITIES	ONE UNKNOWN WITH NUM. COEFFI.	.	.	.	.	23	11	.	9	.	.	.	.	.	.	43
		SOLUT. OF QUADRATIC INEQUALITIES	.	.	.	.	23	11	.	9	.	.	.	.	.	.	43
		GRAPHING LIN. INEQ. IN ONE UNKNO	.	.	.	.	23	11	.	9	.	.	.	.	.	.	43
	TOPIC TOTAL		.	.	.	.	69	33	.	27	.	.	.	.	.	.	129
	7. RATIONAL EXPO.	SIMPLIF. OF A RATIONAL EXPRE.	7	.	.	.	17	10	.	9	7	7	.	7	.	.	36
		EVALUATION OF A RATIONAL EXPRE.	2	.	.	.	22	10	.	9	2	2	.	2	.	.	41
		ADD. & SUB. OF RATIONAL EXPRE.	2	.	.	.	22	10	.	9	2	2	.	2	.	.	41
		MUL. & DIV. OF RATIONAL EXPRE.	2	.	.	.	22	10	.	9	2	2	.	2	.	.	41
	TOPIC TOTAL		13	.	.	.	83	40	.	36	13	13	.	13	.	.	159

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
RAW FREQUENCIES OF RESPONSES

COURSE	TOPIC	SUBTOPIC	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
LOWER THAN PRE-ALGEBRA	11. FUNCTIONS	FUNCT. CONCEPT & USE OF NOTATION	.	.	.	.	11	21	2	9	.	.	.	.	.	.	43
		FUNCT. EVALUATION USING SUBSTIT.	.	.	.	.	11	21	2	9	.	.	.	.	.	.	43
		COMPOSITION OF FUNCTION	.	.	.	.	11	21	2	9	.	.	.	.	.	.	43
		GRAPHING OF FUNCTION	.	.	.	.	11	21	2	9	.	.	.	.	.	.	43
		NUMERICAL FUNCTIONAL EVALUATION	.	.	.	.	11	21	2	9	.	.	.	.	.	.	43
		SUBSTITUTING LITERAL EXPRESS.	.	.	.	.	11	21	2	9	.	.	.	.	.	.	43
		DEFINITION, LAWS & RULES	.	.	.	.	11	21	2	9	.	.	.	.	.	.	43
		INVERSE RELATION BET. LOG. & EXP	.	.	.	.	11	21	2	9	.	.	.	.	.	.	43
		SOLUTION OF LOG. AND EXP. FUNCT.	.	.	.	.	11	21	2	9	.	.	.	.	.	.	43
		GRAPHING OF LOG. AND EXP. FUNCT.	.	.	.	.	11	21	2	9	.	.	.	.	.	.	43
	TOPIC TOTAL		.	.	.	.	110	210	20	90	.	.	.	.	.	.	430
	12. TRIGONOMETRY	FIND. ALGEBRAIC EXPRESS	.	.	.	.	13	21	.	9	.	.	.	.	.	.	43
		DESCRIB. VARIATIONS OF FUNCTION	.	.	.	.	13	21	.	9	.	.	.	.	.	.	43
		FIND. SIDE LENGTHS IN SPEC.TRIA.	.	.	.	.	15	19	.	9	.	.	.	.	.	.	43
		GRAPHING TRIGONOMETRIC FUNCTIONS	.	.	.	.	15	19	.	9	.	.	.	.	.	.	43
		REDUCING TRIGONOMETRIC EXPRE.	.	.	.	.	15	19	.	9	.	.	.	.	.	.	43
		PROOF OF TRIGONOMETRIC IDENTITIE	.	.	.	.	13	21	.	9	.	.	.	.	.	.	43
	TOPIC TOTAL		.	.	.	.	84	120	.	54	.	.	.	.	.	.	258
COURSE TOTAL			652	405	102	2	1527	861	59	563	1159	652	507	1057	102	2	3010

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
RAW FREQUENCIES OF RESPONSES

COURSE	TOPIC	SUBTOPIC	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
MATH A OR MATH B	3. EXPONENTS	SQ. ROOT OF PERFECT SQUARES	8	3	.	3	6	.	.	.	11	8	3	11	.	3	6
		SIMPLIFICATION OF SQ. ROOTS	6	3	.	3	6	.	.	2	9	6	3	9	.	3	8
		ADD. & SUB. OF SQ. ROOTS	6	3	.	3	6	.	.	2	9	6	3	9	.	3	8
		MUL. & DIV. OF SQ. ROOTS	6	3	.	3	6	.	.	2	9	6	3	9	.	3	8
		CONV. BET. RADICALS & RAT. EXPO.	1	.	.	.	9	4	.	6	1	1	.	1	.	.	19
		RATIONALIZ. OF NUMERA. & DENOMI.	1	.	.	.	9	4	.	6	1	1	.	1	.	.	19
		ADD. AND SUB. OF RADICAL EXPRE.	1	.	.	.	9	4	.	6	1	1	.	1	.	.	19
		NUM. CALCU. W/ EXPONENTS & RAD.	4	.	.	.	6	4	.	6	4	4	.	4	.	.	16
		ALGE. CALCU. W/ EXPONENTS & RAD.	4	.	.	.	6	4	.	6	4	4	.	4	.	.	16
		FACTORING & SIMPLI. ALGE. EXPRE.	3	.	.	.	7	4	.	6	3	3	.	3	.	.	17
		ESTIM. & APPROXI. WITH RADICALS.	1	.	.	.	6	4	3	6	1	1	.	1	.	.	19
	TOPIC TOTAL		68	12	.	15	85	28	12	60	80	68	12	80	.	15	185
	4. POLYNOMIALS	ALGE OPERATION OF LITERAL SYMBOL	7	.	.	.	3	4	.	6	7	7	.	7	.	.	13
		SIMPLIF. OF POLYNO. BY GROUPING.	4	.	.	.	6	4	.	6	4	4	.	4	.	.	16
		ADD. & SUB. OF POLYNOMIALS	7	.	.	.	3	4	.	6	7	7	.	7	.	.	13
		EVALUATION OF A POLYNOMIAL(1/2)	7	.	.	.	3	4	.	6	7	7	.	7	.	.	13
		MUL. OF MONOMIAL WITH A POLYNO.	7	.	.	.	3	4	.	6	7	7	.	7	.	.	13
		MUL. OF TWO BINOMIALS	4	.	.	.	6	4	.	6	4	4	.	4	.	.	16
		DIVISION OF POLYNOMIALS	7	.	.	.	3	4	.	6	7	7	.	7	.	.	13
		SQUARING A BINOMIAL	4	.	.	.	6	4	.	6	4	4	.	4	.	.	16
		FACTOR. POLYNOMIALS	4	.	.	.	6	4	.	6	4	4	.	4	.	.	16
		FACTOR. TRINOMIAL OVER INTEGERS	4	.	.	.	6	4	.	6	4	4	.	4	.	.	16
		FACTOR. PERFECT SQ. TRINOMIALS	4	.	.	.	6	4	.	6	4	4	.	4	.	.	16
		SIMPLIF. OF COMPLEX NUMBERS	.	.	.	.	7	4	3	6	.	.	.	.	.	.	20

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
RAW FREQUENCIES OF RESPONSES

COURSE	TOPIC	SUBTOPIC	NEW (A)	EXTENDED (B)	REVIEWED (C)	ASSUMED (D)	TAUGHT LATER (E)	NOT IN CURRI (F)	NOT KNOW (G)	MISSING (M)	A+B+C	A	B+C	A+B	C	D	E+F+G+M
MATH A OR MATH B	8. PROB. & STATS.	PROBABILITY	10	.	.	.	4	.	.	6	10	10	.	10	.	.	10
		DESCRIPTIVE STATISTICS	7	.	.	.	7	.	.	6	7	7	.	7	.	.	13
	TOPIC TOTAL		17	.	.	.	11	.	.	12	17	17	.	17	.	.	23
	9. GEOMETRY	GRAPH READING	3	7	.	.	4	.	.	6	10	3	7	10	.	.	10
		LOCATI. OF POINTS IN CORD. PLANE	6	.	.	.	4	4	.	6	6	6	.	6	.	.	14
		DISTANCE BET. TWO POINTS IN COR.	.	.	.	.	10	4	.	6	.	.	.	.	.	.	20
		PERIMETER & AREA OF TRIANGLES,SQ	3	7	.	.	4	.	.	6	10	3	7	10	.	.	10
		CIRCUMFERENCE & AREA OF CIRCLE	3	7	.	.	4	.	.	6	10	3	7	10	.	.	10
		VOL. OF CUBES, CYLINDERS,RECTAN.	3	.	.	.	7	4	.	6	3	3	.	3	.	.	17
		FINDING SUM OF INTERIOR ANGLES	.	.	.	.	10	4	.	6	.	.	.	.	.	.	20
		ISOSCELES & EQUILATERAL TRIANGLE	.	.	.	.	10	4	.	6	.	.	.	.	.	.	20
		APPLIC. , CONGRUENT TRIANGLES	.	.	.	.	10	4	.	6	.	.	.	.	.	.	20
		APPLIC. , SIMPLE TRIANGLES	.	.	.	.	10	4	.	6	.	.	.	.	.	.	20
		PYTHAGOREAN THEOREM & SPECI. TR.	.	.	.	.	10	4	.	6	.	.	.	.	.	.	20
		PARALLELISM & PERPENDICULARITY	.	.	.	.	10	4	.	6	.	.	.	.	.	.	20
		PROOFS(FORMAL DEDUCTIVE DEMONST.	.	.	.	.	10	4	.	6	.	.	.	.	.	.	20
		TRANSFORMATIONS(TRANSLATION.	.	.	.	.	10	4	.	6	.	.	.	.	.	.	20
		VECTORS	.	.	.	.	7	4	3	6	.	.	.	.	.	.	20
	TOPIC TOTAL		18	21	.	.	120	48	3	90	39	18	21	39	.	.	261
	10. ABSOLUTE	SIMPLIF. & EVALU. OF EXPRESS.	3	.	.	.	7	4	.	6	3	3	.	3	.	.	17
		SOLUTION OF EQUATIONS	.	.	.	.	10	4	.	6	.	.	.	.	.	.	20
	TOPIC TOTAL		3	.	.	.	17	8	.	12	3	3	.	3	.	.	37

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
RAW FREQUENCIES OF RESPONSES

COURSE	TOPIC	SUBTOPIC	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
PRE-ALGEBRA	1. INTEGERS	BASIC OPERATIONS WITH SIGNED NO.	19	19	1	.	.	.	.	.	39	19	20	38	1	.	.
		PRIME FACTORIZATION	19	16	4	.	.	.	.	.	39	19	20	35	4	.	.
		FINDING DISTANCES ON NUMBER LINE	17	18	1	.	2	1	.	.	36	17	19	35	1	.	3
		USING DEFINITION OF DIVISIBILITY	18	6	15	.	.	.	.	.	39	18	21	24	15	.	.
	TOPIC TOTAL		73	59	21	.	2	1	.	.	153	73	80	132	21	.	3
	2. FRACTIONS	ADD. & SUB. OF FRACTIONS	3	21	15	.	.	.	.	.	39	3	36	24	15	.	.
		MUL. & DIV. OF FRACTIONS	3	21	15	.	.	.	.	.	39	3	36	24	15	.	.
		ORDER & COMPARISON OF FRACTIONS	3	21	15	.	.	.	.	.	39	3	36	24	15	.	.
		SIMPLIF. OF COMPLEX FRACTIONS	3	21	14	.	1	.	.	.	38	3	35	24	14	.	1
		ADD. & SUB OF DECIMALS	1	15	23	.	.	.	.	.	39	1	38	16	23	.	.
		MUL. & DIV. OF DECIMALS	1	15	23	.	.	.	.	.	39	1	38	16	23	.	.
		ESTIMATION & APPROXIMATION	1	18	18	2	.	.	.	.	37	1	36	19	18	2	.
		CONV. BET. FRACTIONS & DECIMALS	11	10	18	.	.	.	.	.	39	11	28	21	18	.	.
		CONV. BET. FRACTIONS & PERCENT	11	10	18	.	.	.	.	.	39	11	28	21	18	.	.
		COMPUT. WITH DECI & FRAC, ROUND.	11	10	18	.	.	.	.	.	39	11	28	21	18	.	.
		COMPUTATION OF PERCENT	12	20	7	.	.	.	.	.	39	12	27	32	7	.	.
		CONCEPT OF PROPORTION	13	20	6	.	.	.	.	.	39	13	26	33	6	.	.
		COMPUTATION OF PROPORTIONS	14	19	6	.	.	.	.	.	39	14	25	33	6	.	.
		APPLIC. OF RATIO OR PROPORTIONS	14	19	6	.	.	.	.	.	39	14	25	33	6	.	.
	TOPIC TOTAL		101	240	202	2	1	.	.	.	543	101	442	341	202	2	1
	3. EXPONENTS	APPLIC. LAWS OF EXPONENTS	20	11	1	.	5	2	.	.	32	20	12	31	1	.	7
		POWERS OF 10 & SCIENTIFIC NOTAT.	20	13	1	.	3	2	.	.	34	20	14	33	1	.	5
		EXPONENT. WITH INTEGRAL EXPONEN.	20	11	1	.	5	2	.	.	32	20	12	31	1	.	7

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
RAW FREQUENCIES OF RESPONSES

COURSE	TOPIC	SUBTOPIC	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
	TOPIC TOTAL		102	2	.	.	295	61	.	8	104	102	2	104	.	.	364
PRE-ALGEBRA	5. ALGEBRAIC EQU.	ONE UNKNOWN WITH NUM. COEFFI.	17	2	.	.	19	1	.	.	19	17	2	19	.	.	20
		ONE UNKNOWN WITH LIT. COEFFI.	13	2	.	.	23	1	.	.	15	13	2	15	.	.	24
		SIMPLE LIN. EQUA. IN ONE UNKNOWN	17	2	.	.	19	1	.	.	19	17	2	19	.	.	20
		TWO UNKNOWN BY ELIMINATION	10	.	.	.	21	3	3	2	10	10	.	10	.	.	29
		TWO UNKNOWN BY SUBSTITUTION	10	.	.	.	21	3	3	2	10	10	.	10	.	.	29
		APPLICATION OF EQUATIONS	16	2	.	.	20	1	.	.	18	16	2	18	.	.	21
		GENERATING EQUATIONS FROM DESCR.	18	2	.	.	16	3	.	.	20	18	2	20	.	.	19
		SOLV. EQUA. FROM FACTORED FORM	.	.	.	.	29	10	.	.	.	.	.	.	.	.	39
		SOLVING QUAD.EQUAT.BY FACTORING	.	.	.	.	29	10	.	.	.	.	.	.	.	.	39
		SOLV. QUAD. EQUA. BY QUADRATIC	.	.	.	.	29	10	.	.	.	.	.	.	.	.	39
		GRAPHS OF QUADRATIC RELATIONS	.	.	.	.	29	10	.	.	.	.	.	.	.	.	39
	TOPIC TOTAL		101	10	.	.	255	53	6	4	111	101	10	111	.	.	318
	6. INEQUALITIES	ONE UNKNOWN WITH NUM. COEFFI.	18	.	.	.	18	3	.	.	18	18	.	18	.	.	21
		SOLUT. OF QUADRATIC INEQUALITIES	5	.	.	.	29	5	.	.	5	5	.	5	.	.	34
		GRAPHING LIN. INEQ. IN ONE UNKNO	14	.	.	.	22	3	.	.	14	14	.	14	.	.	25
	TOPIC TOTAL		37	.	.	.	69	11	.	.	37	37	.	37	.	.	80
	7. RATIONAL EXPO.	SIMPLIF. OF A RATIONAL EXPRE.	20	.	.	.	11	5	3	.	20	20	.	20	.	.	19
		EVALUATION OF A RATIONAL EXPRE.	20	.	.	.	14	5	.	.	20	20	.	20	.	.	19
		ADD. & SUB. OF RATIONAL EXPRE.	19	.	.	.	14	6	.	.	19	19	.	19	.	.	20
		MUL. & DIV. OF RATIONAL EXPRE.	19	.	.	.	14	6	.	.	19	19	.	19	.	.	20
	TOPIC TOTAL		78	.	.	.	53	22	3	.	78	78	.	78	.	.	78

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
RAW FREQUENCIES OF RESPONSES

COURSE	TOPIC	SUBTOPIC	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
PRE-ALGEBRA	11. FUNCTIONS	FUNCT. CONCEPT & USE OF NOTATION	3	.	.	.	25	11	.	.	3	3	.	3	.	.	36
		FUNCT. EVALUATION USING SUBSTIT.	3	.	.	.	25	11	.	.	3	3	.	3	.	.	36
		COMPOSITION OF FUNCTION	2	.	.	.	26	11	.	.	2	2	.	2	.	.	37
		GRAPHING OF FUNCTION	2	.	.	.	26	11	.	.	2	2	.	2	.	.	37
		NUMERICAL FUNCTIONAL EVALUATION	.	.	.	.	23	13	3	.	.	.	.	.	.	.	39
		SUBSTITUTING LITERAL EXPRESS.	.	.	.	.	23	13	3	.	.	.	.	.	.	.	39
		DEFINITION, LAWS & RULES	.	.	.	.	23	13	3	.	.	.	.	.	.	.	39
		INVERSE RELATION BET. LOG. & EXP	.	.	.	.	23	13	3	.	.	.	.	.	.	.	39
		SOLUTION OF LOG. AND EXP. FUNCT.	.	.	.	.	23	13	3	.	.	.	.	.	.	.	39
		GRAPHING OF LOG. AND EXP. FUNCT.	.	.	.	.	23	13	3	.	.	.	.	.	.	.	39
	TOPIC TOTAL		10	.	.	.	240	122	18	.	10	10	.	10	.	.	380
	12. TRIGONOMETRY	FIND. ALGEBRAIC EXPRESS	11	.	.	.	15	13	.	.	11	11	.	11	.	.	28
		DESCRIB. VARIATIONS OF FUNCTION	11	.	.	.	15	13	.	.	11	11	.	11	.	.	28
		FIND. SIDE LENGTHS IN SPEC.TRIA.	2	.	.	.	27	10	.	.	2	2	.	2	.	.	37
		GRAPHING TRIGONOMETRIC FUNCTIONS	.	.	.	.	29	10	.	.	.	.	.	.	.	.	39
		REDUCING TRIGONOMETRIC EXPRE.	.	.	.	.	29	10	.	.	.	.	.	.	.	.	39
		PROOF OF TRIGONOMETRIC IDENTITIE	.	.	.	.	26	13	.	.	.	.	.	.	.	.	39
	TOPIC TOTAL		24	.	.	.	141	69	.	.	24	24	.	24	.	.	210
COURSE TOTAL			989	475	312	2	1452	494	47	12	1776	989	787	1464	312	2	2005

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
RAW FREQUENCIES OF RESPONSES

COURSE	TOPIC	SUBTOPIC	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
ALGEBRA 1,2 (OR ALGEBRA I)	3. EXPONENTS	SQ. ROOT OF PERFECT SQUARES	20	7	3	.	2	.	.	.	30	20	10	27	3	.	2
		SIMPLIFICATION OF SQ. ROOTS	24	2	2	.	4	.	.	.	28	24	4	26	2	.	4
		ADD. & SUB. OF SQ. ROOTS	22	4	2	.	4	.	.	.	28	22	6	26	2	.	4
		MUL. & DIV. OF SQ. ROOTS	22	4	2	.	4	.	.	.	28	22	6	26	2	.	4
		CONV. BET. RADICALS & RAT. EXPO.	25	.	.	.	7	.	.	.	25	25	.	25	.	.	7
		RATIONALIZ. OF NUMERA. & DENOMI.	25	.	.	.	7	.	.	.	25	25	.	25	.	.	7
		ADD. AND SUB. OF RADICAL EXPRE.	25	.	.	.	7	.	.	.	25	25	.	25	.	.	7
		NUM. CALCU. W/ EXPONENTS & RAD.	25	.	.	.	7	.	.	.	25	25	.	25	.	.	7
		ALGE. CALCU. W/ EXPONENTS & RAD.	25	.	.	.	7	.	.	.	25	25	.	25	.	.	7
		FACTORING & SIMPLI. ALGE. EXPRE.	25	.	.	.	7	.	.	.	25	25	.	25	.	.	7
		ESTIM. & APPROXI. WITH RADICALS.	25	2	.	.	5	.	.	.	27	25	2	27	.	.	5
	TOPIC TOTAL		333	38	9	2	63	.	.	3	380	333	47	371	9	2	66
	4. POLYNOMIALS	ALGE OPERATION OF LITERAL SYMBOL	25	7	.	.	.	.	.	.	32	25	7	32	.	.	.
		SIMPLIF. OF POLYNO. BY GROUPING.	27	5	.	.	.	.	.	.	32	27	5	32	.	.	.
		ADD. & SUB. OF POLYNOMIALS	27	5	.	.	.	.	.	.	32	27	5	32	.	.	.
		EVALUATION OF A POLYNOMIAL(1/2)	27	5	.	.	.	.	.	.	32	27	5	32	.	.	.
		MUL. OF MONOMIAL WITH A POLYNO.	27	5	.	.	.	.	.	.	32	27	5	32	.	.	.
		MUL. OF TWO BINOMIALS	27	5	.	.	.	.	.	.	32	27	5	32	.	.	.
		DIVISION OF POLYNOMIALS	29	2	.	.	1	.	.	.	31	29	2	31	.	.	1
		SQUARING A BINOMIAL	29	2	.	.	1	.	.	.	31	29	2	31	.	.	1
		FACTOR. POLYNOMIALS	27	5	.	.	.	.	.	.	32	27	5	32	.	.	.
		FACTOR. TRINOMIAL OVER INTEGERS	31	.	.	.	1	.	.	.	31	31	.	31	.	.	1
		FACTOR. PERFECT SQ. TRINOMIALS	29	2	.	.	1	.	.	.	31	29	2	31	.	.	1
		SIMPLIF. OF COMPLEX NUMBERS	19	.	.	.	13	.	.	.	19	19	.	19	.	.	13

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
RAW FREQUENCIES OF RESPONSES

COURSE	TOPIC	SUBTOPIC	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
ALGEBRA 1,2 (OR ALGEBRA I)	8. PROB. & STATS.	PROBABILITY	6	4	.	.	22	.	.	.	10	6	4	10	.	.	22
		DESCRIPTIVE STATISTICS	6	3	.	.	20	.	3	.	9	6	3	9	.	.	23
	TOPIC TOTAL		12	7	.	.	42	.	3	.	19	12	7	19	.	.	45
	9. GEOMETRY	GRAPH READING	17	9	.	2	4	.	.	.	26	17	9	26	.	2	4
		LOCATI. OF POINTS IN CORD. PLANE	19	7	.	2	4	.	.	.	26	19	7	26	.	2	4
		DISTANCE BET. TWO POINTS IN COR.	23	2	.	2	5	.	.	.	25	23	2	25	.	2	5
		PERIMETER & AREA OF TRIANGLES,SQ	9	15	1	3	4	.	.	.	25	9	16	24	1	3	4
		CIRCUMFERENCE & AREA OF CIRCLE	6	8	1	4	13	.	.	.	15	6	9	14	1	4	13
		VOL. OF CUBES, CYLINDERS,RECTAN.	5	3	1	2	21	.	.	.	9	5	4	8	1	2	21
		FINDING SUM OF INTERIOR ANGLES	1	2	.	2	27	.	.	.	3	1	2	3	.	2	27
		ISOSCELES & EQUILATERAL TRIANGLE	5	.	.	4	23	.	.	.	5	5	.	5	.	4	23
		APPLIC. , CONGRUENT TRIANGLES	1	.	.	9	22	.	.	.	1	1	.	1	.	9	22
		APPLIC. , SIMPLE TRIANGLES	6	.	.	9	17	.	.	.	6	6	.	6	.	9	17
		PYTHAGOREAN THEOREM & SPECI. TR.	8	.	2	.	22	.	.	.	10	8	2	8	2	.	22
		PARALLELISM & PERPENDICULARITY	2	1	2	2	25	.	.	.	5	2	3	3	2	2	25
		PROOFS(FORMAL DEDUCTIVE DEMONST.	2	.	2	.	26	2	.	.	4	2	2	2	2	.	28
		TRANSFORMATIONS(TRANSLATION.	.	.	2	.	26	2	2	.	2	.	2	.	2	.	30
		VECTORS	.	.	2	.	26	2	2	.	2	.	2	.	2	.	30
	TOPIC TOTAL		104	47	13	41	265	6	4	.	164	104	60	151	13	41	275
	10. ABSOLUTE	SIMPLIF. & EVALU. OF EXPRESS.	26	3	.	.	1	.	2	.	29	26	3	29	.	.	3
		SOLUTION OF EQUATIONS	29	.	.	.	1	.	2	.	29	29	.	29	.	.	3
	TOPIC TOTAL		55	3	.	.	2	.	4	.	58	55	3	58	.	.	6

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
RAW FREQUENCIES OF RESPONSES

COURSE	TOPIC	SUBTOPIC	NEW	EXTENDED REVIEWED		ASSUMED	TAUGHT LATER	NOT IN CURRI	NOT KNOW	MISSING	A+B+C	A	B+C	A+B	C	D	E+F+G+M
			A	B	C	D	E	F	G	M							
GEOMETRY	1. INTEGERS	BASIC OPERATIONS WITH SIGNED NO.	.	3	7	12	.	.	.	.	10	.	10	3	7	12	.
		PRIME FACTORIZATION	.	3	5	14	.	.	.	.	8	.	8	3	5	14	.
		FINDING DISTANCES ON NUMBER LINE	2	4	5	11	.	.	.	.	11	2	9	6	5	11	.
		USING DEFINITION OF DIVISIBILITY	.	5	4	13	.	.	.	.	9	.	9	5	4	13	.
	TOPIC TOTAL		2	15	21	50	.	.	.	.	38	2	36	17	21	50	.
	2. FRACTIONS	ADD. & SUB. OF FRACTIONS	.	3	7	12	.	.	.	.	10	.	10	3	7	12	.
		MUL. & DIV. OF FRACTIONS	.	3	7	12	.	.	.	.	10	.	10	3	7	12	.
		ORDER & COMPARISON OF FRACTIONS	.	3	7	12	.	.	.	.	10	.	10	3	7	12	.
		SIMPLIF. OF COMPLEX FRACTIONS	.	3	8	9	2	.	.	.	11	.	11	3	8	9	2
		ADD. & SUB OF DECIMALS	.	3	5	14	.	.	.	.	8	.	8	3	5	14	.
		MUL. & DIV. OF DECIMALS	.	3	7	12	.	.	.	.	10	.	10	3	7	12	.
		ESTIMATION & APPROXIMATION	.	5	5	12	.	.	.	.	10	.	10	5	5	12	.
		CONV. BET. FRACTIONS & DECIMALS	.	4	6	12	.	.	.	.	10	.	10	4	6	12	.
		CONV. BET. FRACTIONS & PERCENT	.	4	4	14	.	.	.	.	8	.	8	4	4	14	.
		COMPUT. WITH DECI & FRAC, ROUND.	.	4	6	12	.	.	.	.	10	.	10	4	6	12	.
		COMPUTATION OF PERCENT	.	5	6	11	.	.	.	.	11	.	11	5	6	11	.
		CONCEPT OF PROPORTION	3	10	7	2	.	.	.	.	20	3	17	13	7	2	.
		COMPUTATION OF PROPORTIONS	5	10	5	2	.	.	.	.	20	5	15	15	5	2	.
		APPLIC. OF RATIO OR PROPORTIONS	5	10	5	2	.	.	.	.	20	5	15	15	5	2	.
	TOPIC TOTAL		13	70	85	138	2	.	.	.	168	13	155	83	85	138	2
	3. EXPONENTS	APPLIC. LAWS OF EXPONENTS	.	6	9	7	.	.	.	.	15	.	15	6	9	7	.
		POWERS OF 10 & SCIENTIFIC NOTAT.	.	5	6	9	1	1	.	.	11	.	11	5	6	9	2
		EXPONENT. WITH INTEGRAL EXPONEN.	.	5	9	7	.	1	.	.	14	.	14	5	9	7	1

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
RAW FREQUENCIES OF RESPONSES

COURSE	TOPIC	SUBTOPIC	NEW	EXTENDED	REVIEWED	ASSUMED	TAUGHT LATER	NOT IN CURRI	NOT KNOW	MISSING	A+B+C	A	B+C	A+B	C	D	E+F+G+M
			A	B	C	D	E	F	G	M							
	TOPIC TOTAL		10	53	95	64	18	.	24	.	158	10	148	63	95	64	42
GEOMETRY	5. ALGEBRAIC EQU.	ONE UNKNOWN WITH NUM. COEFFI.	1	4	5	10	.	.	2	.	10	1	9	5	5	10	2
		ONE UNKNOWN WITH LIT. COEFFI.	1	4	3	10	2	.	2	.	8	1	7	5	3	10	4
		SIMPLE LIN. EQUA. IN ONE UNKNOWN	1	4	5	10	.	.	2	.	10	1	9	5	5	10	2
		TWO UNKNOWN BY ELIMINATION	1	4	7	8	.	.	2	.	12	1	11	5	7	8	2
		TWO UNKNOWN BY SUBSTITUTION	1	4	7	8	.	.	2	.	12	1	11	5	7	8	2
		APPLICATION OF EQUATIONS	3	6	3	8	.	.	2	.	12	3	9	9	3	8	2
		GENERATING EQUATIONS FROM DESCR.	1	6	3	8	2	.	2	.	10	1	9	7	3	8	4
		SOLV. EQUA. FROM FACTORED FORM	.	4	10	5	.	2	.	1	14	.	14	4	10	5	3
		SOLVING QUAD.EQUAT.BY FACTORING	.	6	8	5	.	2	.	1	14	.	14	6	8	5	3
		SOLV. QUAD. EQUA. BY QUADRATIC	.	4	6	5	2	2	.	3	10	.	10	4	6	5	7
		GRAPHS OF QUADRATIC RELATIONS	.	1	5	7	6	2	.	1	6	.	6	1	5	7	9
	TOPIC TOTAL		9	47	62	84	12	8	14	6	118	9	109	56	62	84	40
	6. INEQUALITIES	ONE UNKNOWN WITH NUM. COEFFI.	.	4	4	11	.	2	.	1	8	.	8	4	4	11	3
		SOLUT. OF QUADRATIC INEQUALITIES	.	2	4	7	6	2	.	1	6	.	6	2	4	7	9
		GRAPHING LIN. INEQ. IN ONE UNKNO	.	4	4	11	.	2	.	1	8	.	8	4	4	11	3
	TOPIC TOTAL		.	10	12	29	6	6	.	3	22	.	22	10	12	29	15
	7. RATIONAL EXPO.	SIMPLIF. OF A RATIONAL EXPRE.	.	4	5	8	2	2	.	1	9	.	9	4	5	8	5
		EVALUATION OF A RATIONAL EXPRE.	.	4	5	8	2	2	.	1	9	.	9	4	5	8	5
		ADD. & SUB. OF RATIONAL EXPRE.	.	4	5	10	.	2	.	1	9	.	9	4	5	10	3
		MUL. & DIV. OF RATIONAL EXPRE.	.	4	5	10	.	2	.	1	9	.	9	4	5	10	3
	TOPIC TOTAL		.	16	20	36	4	8	.	4	36	.	36	16	20	36	16

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
RAW FREQUENCIES OF RESPONSES

COURSE	TOPIC	SUBTOPIC	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
GEOMETRY	11. FUNCTIONS	FUNCT. CONCEPT & USE OF NOTATION	2	1	4	2	11	1	.	1	7	2	5	3	4	2	13
		FUNCT. EVALUATION USING SUBSTIT.	2	1	4	2	11	1	.	1	7	2	5	3	4	2	13
		COMPOSITION OF FUNCTION	2	.	2	2	14	1	.	1	4	2	2	2	2	2	16
		GRAPHING OF FUNCTION	2	.	2	1	13	2	1	1	4	2	2	2	2	1	17
		NUMERICAL FUNCTIONAL EVALUATION	2	.	.	1	17	1	.	1	2	2	.	2	.	1	19
		SUBSTITUTING LITERAL EXPRESS.	2	.	.	1	17	1	.	1	2	2	.	2	.	1	19
		DEFINITION, LAWS & RULES	2	.	.	1	17	1	.	1	2	2	.	2	.	1	19
		INVERSE RELATION BET. LOG. & EXP	2	.	.	1	17	1	.	1	2	2	.	2	.	1	19
		SOLUTION OF LOG. AND EXP. FUNCT.	2	.	.	1	17	1	.	1	2	2	.	2	.	1	19
		GRAPHING OF LOG. AND EXP. FUNCT.	2	.	.	1	17	1	.	1	2	2	.	2	.	1	19
	TOPIC TOTAL		20	2	12	13	151	11	1	10	34	20	14	22	12	13	173
	12. TRIGONOMETRY	FIND. ALGEBRAIC EXPRESS	5	.	.	1	15	.	.	1	5	5	.	5	.	1	16
		DESCRIB. VARIATIONS OF FUNCTION	3	.	.	1	17	.	.	1	3	3	.	3	.	1	18
		FIND. SIDE LENGTHS IN SPEC.TRIA.	12	.	.	1	8	.	.	1	12	12	.	12	.	1	9
		GRAPHING TRIGONOMETRIC FUNCTIONS	2	.	.	1	17	1	.	1	2	2	.	2	.	1	19
		REDUCING TRIGONOMETRIC EXPRE.	2	.	.	1	17	1	.	1	2	2	.	2	.	1	19
		PROOF OF TRIGONOMETRIC IDENTITIE	2	.	.	1	17	1	.	1	2	2	.	2	.	1	19
	TOPIC TOTAL		26	.	.	6	91	3	.	6	26	26	.	26	.	6	100
COURSE TOTAL			372	313	434	485	357	57	68	48	1119	372	747	685	434	485	530

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  25  .              (80 THRU 81=10 )
  26  .              (82 THRU 91=11 )
  27  .              (92 THRU 97=12 )
  28  .  VALUE LABEL COURSE
  29  .                   '01'  'LOWER THAN PRE-ALGEBRA      '
  30  .                   '02'  'MATH A OR MATH B            '
  31  .                   '11'  'PRE-ALGEBRA                 '
  32  .                   '21'  'ALGEBRA 1,2 (OR ALGEBRA I)  '
  33  .                   '31'  'ALGEBRA 3,4 (OR ALGEBRA II) '
  34  .                   '32'  'HONORED ALGEBRA             '
  35  .                   '33'  'ALGEBRA II/TRIGONOMETRY     '
  36  .                   '41'  'PRE CALCULUS                '
  37  .                   '29'  'GEOMETRY                    '
  38  .                   '61'  'TRIGONOMETRY                '/
  39  .                SUB
  40  .                  1 '1. INTEGERS      '
  41  .                  2 '2. FRACTIONS     '
  42  .                  3 '3. EXPONENTS     '
  43  .                  4 '4. POLYNOMIALS   '
  44  .                  5 '5. ALGEBRAIC EQU.'
  45  .                  6 '6. INEQUALITIES  '
  46  .                  7 '7. RATIONAL EXPO.'
  47  .                  8 '8. PROB. & STATS.'
  48  .                  9 '9. GEOMETRY      '
  49  .                 10 '10. ABSOLUTE     '
  50  .                 11 '11. FUNCTIONS    '
  51  .                 12 '12. TRIGONOMETRY '/
  52  .              ITEM
  53  .       1 'BASIC OPERATIONS WITH SIGNED NO.'
  54  .       2 'PRIME FACTORIZATION             '
  55  .       3 'FINDING DISTANCES ON NUMBER LINE'
  56  .       4 'USING DEFINITION OF DIVISIBILITY'
  57  .       5 'ADD. & SUB. OF FRACTIONS        '
  58  .       6 'MUL. & DIV. OF FRACTIONS        '
  59  .       7 'ORDER & COMPARISON OF FRACTIONS  '
  60  .       8 'SIMPLIF. OF COMPLEX  FRACTIONS  '
  61  .       9 'ADD. & SUB OF DECIMALS          '
  62  .      10 'MUL. & DIV. OF DECIMALS         '
  63  .      11 'ESTIMATION & APPROXIMATION      '
  64  .      12 'CONV. BET. FRACTIONS & DECIMALS '
  65  .      13 'CONV. BET. FRACTIONS & PERCENT  '
  66  .      14 'COMPUT. WITH DECI & FRAC, ROUND.'
  67  .      15 'COMPUTATION OF PERCENT          '
  68  .      16 'CONCEPT OF PROPORTION           '
  69  .      17 'COMPUTATION OF PROPORTIONS      '
  70  .      18 'APPLIC. OF RATIO OR PROPORTIONS '
  71  .      19 'APPLIC. LAWS OF EXPONENTS       '
  72  .      20 'POWERS OF 10 & SCIENTIFIC NOTAT.'
  73  .      21 'EXPONENT. WITH INTEGRAL EXPONEN.'
  74  .      22 'SQ. ROOT OF PERFECT SQUARES     '
  75  .      23 'SIMPLIFICATION OF SQ. ROOTS     '
  76  .      24 'ADD. & SUB. OF SQ. ROOTS        '
  77  .      25 'MUL. & DIV. OF SQ. ROOTS        '
  78  .      26 'CONV. BET. RADICALS & RAT. EXPO.'
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 133  .     81 'SOLUTION OF EQUATIONS          '
 134  .     82 'FUNCT. CONCEPT & USE OF NOTATION'
 135  .     83 'FUNCT. EVALUATION USING SUBSTIT.'
 136  .     84 'COMPOSITION OF FUNCTION         '
 137  .     85 'GRAPHING OF FUNCTION            '
 138  .     86 'NUMERICAL FUNCTIONAL  EVALUATION'
 139  .     87 'SUBSTITUTING LITERAL EXPRESS.   '
 140  .     88 'DEFINITION, LAWS & RULES        '
 141  .     89 'INVERSE RELATION BET. LOG. & EXP'
 142  .     90 'SOLUTION OF LOG. AND EXP. FUNCT.'
 143  .     91 'GRAPHING OF LOG. AND EXP. FUNCT.'
 144  .     92 'FIND. ALGEBRAIC EXPRESS         '
 145  .     93 'DESCRIB. VARIATIONS OF FUNCTION '
 146  .     94 'FIND. SIDE LENGTHS IN SPEC.TRIA.'
 147  .     95 'GRAPHING TRIGONOMETRIC FUNCTIONS'
 148  .     96 'REDUCING TRIGONOMETRIC EXPRE.   '
 149  .     97 'PROOF OF TRIGONOMETRIC IDENTITIE'
 150  .   sort cases by course,sub,item

SIZE OF FILE TO BE SORTED:     17072 CASES OF    144 BYTES EACH.
SORT COMPLETED SUCCESSFULLY.  FILE SIZE:     819456 BYTES.
                        MEMORY AVAILABLE:    344746 BYTES.
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Figure 2

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
TOPIC BY TOPIC (12 CATEGORIES), PERCENTAGE

TOPIC	COURSE	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
2. FRACTIONS	LOWER THAN PRE-ALGEBRA	.417	.432	.088	0.00	.047	0.00	.013	.003	.937	.417	.520	.849	.088	0.00	.063
	MATH A OR MATH B	.436	.268	.175	0.00	.054	.011	0.00	.057	.879	.436	.443	.704	.175	0.00	.121
	PRE-ALGEBRA	.185	.440	.370	.004	.002	0.00	0.00	0.00	.995	.185	.810	.625	.370	.004	.002
	ALGEBRA 1,2 (OR ALGEBRA 1)	.105	.435	.185	.275	0.00	0.00	0.00	0.00	.725	.105	.621	.540	.185	.275	0.00
	GEOMETRY	.042	.227	.276	.448	.006	0.00	0.00	0.00	.545	.042	.503	.269	.276	.448	.006
TOPIC MEAN		.245	.385	.216	.120	.021	.001	.004	.008	.845	.245	.601	.629	.216	.120	.034

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
TOPIC BY TOPIC (12 CATEGORIES), PERCENTAGE

TOPIC	COURSE	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
4. POLYNOMIALS	LOWER THAN PRE-ALGEBRA	.076	.033	0.00	0.00	.519	.256	0.00	.116	.109	.076	.033	.109	0.00	0.00	.891
	MATH A OR MATH B	.246	0.00	0.00	0.00	.242	.200	.012	.300	.246	.246	0.00	.246	0.00	0.00	.754
	PRE-ALGEBRA	.218	.004	0.00	0.00	.630	.130	0.00	.017	.222	.218	.004	.222	0.00	0.00	.778
	ALGEBRA 1,2 (OR ALGEBRA I)	.844	.112	0.00	0.00	.044	0.00	0.00	0.00	.956	.844	.112	.956	0.00	0.00	.044
	GEOMETRY	.038	.201	.360	.242	.068	0.00	.091	0.00	.598	.038	.561	.239	.360	.242	.159
TOPIC MEAN		.285	.061	.051	.034	.350	.129	.014	.075	.397	.285	.112	.347	.051	.034	.568

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
TOPIC BY TOPIC (12 CATEGORIES), PERCENTAGE

TOPIC	COURSE	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
6. INEQUALITIES	LOWER THAN PRE-ALGEBRA	0.00	0.00	0.00	0.00	.535	.256	0.00	.209	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	MATH A OR MATH B	.250	0.00	0.00	0.00	.250	.200	0.00	.300	.250	.250	0.00	.250	0.00	0.00	.750
	PRE-ALGEBRA	.316	0.00	0.00	0.00	.590	.094	0.00	0.00	.316	.316	0.00	.316	0.00	0.00	.684
	ALGEBRA 1,2 (OR ALGEBRA I)	.833	.083	0.00	0.00	.083	0.00	0.00	0.00	.917	.833	.083	.917	0.00	0.00	.083
	GEOMETRY	0.00	.152	.182	.439	.091	.091	0.00	.045	.333	0.00	.333	.152	.182	.439	.227
TOPIC MEAN		.282	.038	.026	.062	.357	.132	0.00	.103	.346	.282	.064	.321	.026	.062	.592

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
TOPIC BY TOPIC (12 CATEGORIES), PERCENTAGE

TOPIC	COURSE	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
8. PROB. & STATS.	LOWER THAN PRE-ALGEBRA	.198	0.00	0.00	0.00	.372	.163	.058	.209	.198	.198	0.00	.198	0.00	0.00	.802
	MATH A OR MATH B	.425	0.00	0.00	0.00	.275	0.00	0.00	.300	.425	.425	0.00	.425	0.00	0.00	.575
	PRE-ALGEBRA	.077	.359	0.00	0.00	.231	.179	.154	0.00	.436	.077	.359	.436	0.00	0.00	.564
	ALGEBRA 1,2 (OR ALGEBRA I)	.187	.109	0.00	0.00	.656	0.00	.047	0.00	.297	.187	.109	.297	0.00	0.00	.703
	GEOMETRY	0.00	.091	0.00	0.00	.591	.136	.136	.045	.091	0.00	.091	.091	0.00	0.00	.909
TOPIC MEAN		.167	.125	0.00	0.00	.413	.109	.083	.103	.292	.167	.125	.292	0.00	0.00	.708

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
TOPIC BY TOPIC (12 CATEGORIES), PERCENTAGE

TOPIC	COURSE	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
10. ABSOLUTE	LOWER THAN PRE-ALGEBRA	0.00	0.00	.070	0.00	.419	.256	.047	.209	.070	0.00	.070	0.00	.070	0.00	.930
	MATH A OR MATH B	.075	0.00	0.00	0.00	.425	.200	0.00	.300	.075	.075	0.00	.075	0.00	0.00	.925
	PRE-ALGEBRA	.603	0.00	0.00	0.00	.321	.077	0.00	0.00	.603	.603	0.00	.603	0.00	0.00	.397
	ALGEBRA 1,2 (OR ALGEBRA I)	.859	.047	0.00	0.00	.031	0.00	.062	0.00	.906	.859	.047	.906	0.00	0.00	.094
	GEOMETRY	.182	.091	.182	.227	.091	.091	.091	.045	.455	.182	.273	.273	.182	.227	.318
TOPIC MEAN		.362	.022	.045	.032	.269	.128	.038	.103	.429	.362	.067	.385	.045	.032	.538

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
TOPIC BY TOPIC (12 CATEGORIES), PERCENTAGE

TOPIC	COURSE	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
12. TRIGONOMETRY	LOWER THAN PRE-ALGEBRA	0.00	0.00	0.00	0.00	.326	.465	0.00	.209	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	MATH A OR MATH B	0.00	0.00	0.00	0.00	.500	.200	0.00	.300	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	PRE-ALGEBRA	.103	0.00	0.00	0.00	.603	.295	0.00	0.00	.103	.103	0.00	.103	0.00	0.00	.897
	ALGEBRA 1,2 (OR ALGEBRA I)	.005	0.00	.062	0.00	.927	.005	0.00	0.00	.068	.005	.062	.005	.062	0.00	.932
	GEOMETRY	.197	0.00	0.00	.045	.689	.023	0.00	.045	.197	.197	0.00	.197	0.00	.045	.758
TOPIC MEAN		.054	0.00	.013	.006	.592	.232	0.00	.103	.067	.054	.013	.054	.013	.006	.926

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REPORT REQUIRED      1296 ADDITIONAL
BYTES FOR DYNAMIC BUFFERING OF THE OUTPUT.

PRECEDING TASK REQUIRED       16.48 SECONDS CPU TIME;       38.21 SECONDS ELAPSED.

 176  0

   176 COMMAND LINES READ.
     0 ERRORS DETECTED.
     0 WARNINGS ISSUED.
    20 SECONDS CPU TIME.
    52 SECONDS ELAPSED TIME.
       END OF JOB.
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  25  0              (65 THRU 79=9  )
  26  0              (80 THRU 81=10 )
  27  0              (82 THRU 91=11 )
  28  0              (92 THRU 97=12 )
  29  0  VALUE LABEL COURSE
  30  0                   '01'  'LOWER THAN PRE-ALGEBRA      '
  31  0                   '02'  'MATH A OR MATH B            '
  32  0                   '11'  'PRE-ALGEBRA                 '
  33  0                   '21'  'ALGEBRA 1,2 (OR ALGEBRA I)  '
  34  0                   '31'  'ALGEBRA 3,4 (OR ALGEBRA II) '
  35  0                   '32'  'HONORED ALGEBRA             '
  36  0                   '33'  'ALGEBRA II/TRIGONOMETRY     '
  37  0                   '41'  'PRE CALCULUS                '
  38  0                   '29'  'GEOMETRY                    '
  39  0                   '61'  'TRIGONOMETRY                '/
  40  0                SUB
  41  0                  1 '1. INTEGERS      '
  42  0                  2 '2. FRACTIONS     '
  43  0                  3 '3. EXPONENTS     '
  44  0                  4 '4. POLYNOMIALS   '
  45  0                  5 '5. ALGEBRAIC EQU.'
  46  0                  6 '6. INEQUALITIES  '
  47  0                  7 '7. RATIONAL EXPO.'
  48  0                  8 '8. PROB. & STATS.'
  49  0                  9 '9. GEOMETRY      '
  50  0                 10 '10. ABSOLUTE     '
  51  0                 11 '11. FUNCTIONS    '
  52  0                 12 '12. TRIGONOMETRY '/
  53  0             ITEM
  54  0       1 'BASIC OPERATIONS WITH SIGNED NO.'
  55  0       2 'PRIME FACTORIZATION             '
  56  0       3 'FINDING DISTANCES ON NUMBER LINE'
  57  0       4 'USING DEFINITION OF DIVISIBILITY'
  58  0       5 'ADD. & SUB. OF FRACTIONS        '
  59  0       6 'MUL. & DIV. OF FRACTIONS        '
  60  0       7 'ORDER & COMPARISON OF FRACTIONS '
  61  0       8 'SIMPLIF. OF COMPLEX  FRACTIONS  '
  62  0       9 'ADD. & SUB OF DECIMALS          '
  63  0      10 'MUL. & DIV. OF DECIMALS         '
  64  0      11 'ESTIMATION & APPROXIMATION      '
  65  0      12 'CONV. BET. FRACTIONS & DECIMALS '
  66  0      13 'CONV. BET. FRACTIONS & PERCENT  '
  67  0      14 'COMPUT. WITH DECI & FRAC, ROUND.'
  68  0      15 'COMPUTATION OF PERCENT          '
  69  0      16 'CONCEPT OF PROPORTION           '
  70  0      17 'COMPUTATION OF PROPORTIONS      '
  71  0      18 'APPLIC. OF RATIO OR PROPORTIONS '
  72  0      19 'APPLIC. LAWS OF EXPONENTS       '
  73  0      20 'POWERS OF 10 & SCIENTIFIC NOTAT.'
  74  0      21 'EXPONENT. WITH INTEGRAL EXPONEN.'
  75  0      22 'SQ. ROOT OF PERFECT SQUARES     '
  76  0      23 'SIMPLIFICATION OF SQ. ROOTS     '
  77  0      24 'ADD. & SUB. OF SQ. ROOTS        '
  78  0      25 'MUL. & DIV. OF SQ. ROOTS        '
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 133  0     80 'SIMPLIF. & EVALU. OF EXPRESS.   '
 134  0     81 'SOLUTION OF EQUATIONS           '
 135  0     82 'FUNCT. CONCEPT & USE OF NOTATION'
 136  0     83 'FUNCT. EVALUATION USING SUBSTIT.'
 137  0     84 'COMPOSITION OF FUNCTION         '
 138  0     85 'GRAPHING OF FUNCTION            '
 139  0     86 'NUMERICAL FUNCTIONAL  EVALUATION'
 140  0     87 'SUBSTITUTING LITERAL EXPRESS.   '
 141  0     88 'DEFINITION, LAWS & RULES        '
 142  0     89 'INVERSE RELATION BET. LOG. & EXP'
 143  0     90 'SOLUTION OF LOG. AND EXP. FUNCT.'
 144  0     91 'GRAPHING OF LOG. AND EXP. FUNCT.'
 145  0     92 'FIND. ALGEBRAIC EXPRESS         '
 146  0     93 'DESCRIB. VARIATIONS OF FUNCTION '
 147  0     94 'FIND. SIDE LENGTHS IN SPEC.TRIA.'
 148  0     95 'GRAPHING TRIGONOMETRIC FUNCTIONS'
 149  0     96 'REDUCING TRIGONOMETRIC EXPRE.   '
 150  0     97 'PROOF OF TRIGONOMETRIC IDENTITIE'
 151  0   SORT CASES BY SUB COURSE

SIZE OF FILE TO BE SORTED:     15132 CASES OF    144 BYTES EACH.
SORT COMPLETED SUCCESSFULLY.  FILE SIZE:     635544 BYTES.
                         MEMORY AVAILABLE:     344746 BYTES.
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Figure 3

USING DEFINITION OF DIVISIBILITY	LOWER THAN PRE-ALGEBRA	.233	.465	.023	0.00	.256	0.00	0.00	.023	.721	.233	.488	.698	.023	0.00	.279
	MATH A OR MATH B	.600	.350	.050	0.00	0.00	0.00	0.00	0.00	1.00	.600	.400	.950	.050	0.00	0.00
	PRE-ALGEBRA	.462	.154	.385	0.00	0.00	0.00	0.00	0.00	1.00	.462	.538	.615	.385	0.00	0.00
	ALGEBRA 1,2 (OR ALGEBRA I)	.250	.187	.156	.250	0.00	0.00	0.00	.156	.594	.250	.344	.437	.156	.250	.156
	GEOMETRY	0.00	.227	.182	.591	0.00	0.00	0.00	0.00	.409	0.00	.409	.227	.182	.591	0.00
SUBTOPIC MEAN		.308	.282	.167	.135	.071	0.00	0.00	.038	.756	.308	.449	.590	.167	.135	.109

1 MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
SUBTOPIC BY SUBTOPIC (97 CATEGORIES), PERCENTAGE

SUBTOPIC	COURSE	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
ADD. & SUB. OF FRACTIONS	LOWER THAN PRE-ALGEBRA	.279	.558	.163	0.00	0.00	0.00	0.00	0.00	1.00	.279	.721	.837	.163	0.00	0.00
	MATH A OR MATH B	.550	.250	.200	0.00	0.00	0.00	0.00	0.00	1.00	.550	.450	.800	.200	0.00	0.00
	PRE-ALGEBRA	.077	.538	.385	0.00	0.00	0.00	0.00	0.00	1.00	.077	.923	.615	.385	0.00	0.00
	ALGEBRA 1,2 (OR ALGEBRA I)	0.00	.437	.219	.344	0.00	0.00	0.00	0.00	.656	0.00	.656	.437	.219	.344	0.00
	GEOMETRY	0.00	.136	.318	.545	0.00	0.00	0.00	0.00	.455	0.00	.455	.136	.318	.545	0.00
SUBTOPIC MEAN		.167	.429	.256	.147	0.00	0.00	0.00	0.00	.853	.167	.686	.596	.256	.147	0.00
MUL. & DIV. OF FRACTIONS	LOWER THAN PRE-ALGEBRA	.279	.558	.163	0.00	0.00	0.00	0.00	0.00	1.00	.279	.721	.837	.163	0.00	0.00
	MATH A OR MATH B	.550	.250	.200	0.00	0.00	0.00	0.00	0.00	1.00	.550	.450	.800	.200	0.00	0.00
	PRE-ALGEBRA	.077	.538	.385	0.00	0.00	0.00	0.00	0.00	1.00	.077	.923	.615	.385	0.00	0.00
	ALGEBRA 1,2 (OR ALGEBRA I)	0.00	.437	.281	.281	0.00	0.00	0.00	0.00	.719	0.00	.719	.437	.281	.281	0.00
	GEOMETRY	0.00	.136	.318	.545	0.00	0.00	0.00	0.00	.455	0.00	.455	.136	.318	.545	0.00
SUBTOPIC MEAN		.167	.429	.269	.135	0.00	0.00	0.00	0.00	.865	.167	.699	.596	.269	.135	0.00
ORDER & COMPARISON. OF FRACTIONS	LOWER THAN PRE-ALGEBRA	.279	.558	.163	0.00	0.00	0.00	0.00	0.00	1.00	.279	.721	.837	.163	0.00	0.00
	MATH A OR MATH B	.550	.250	.200	0.00	0.00	0.00	0.00	0.00	1.00	.550	.450	.800	.200	0.00	0.00
	PRE-ALGEBRA	.077	.538	.385	0.00	0.00	0.00	0.00	0.00	1.00	.077	.923	.615	.385	0.00	0.00
	ALGEBRA 1,2 (OR ALGEBRA I)	0.00	.500	.156	.344	0.00	0.00	0.00	0.00	.656	0.00	.656	.500	.156	.344	0.00
	GEOMETRY	0.00	.136	.318	.545	0.00	0.00	0.00	0.00	.455	0.00	.455	.136	.318	.545	0.00
SUBTOPIC MEAN		.167	.442	.244	.147	0.00	0.00	0.00	0.00	.853	.167	.686	.609	.244	.147	0.00
SIMPLIF. OF COMPLEX	LOWER THAN PRE-ALGEBRA	.279	.465	.116	0.00	.093	0.00	0.00	.047	.860	.279	.581	.744	.116	0.00	.140

	PRE-ALGEBRA	.282	.256	.462	0.00	0.00	0.00	0.00	0.00	1.00	.282	.718	.538	.462	0.00	0.00
	ALGEBRA 1,2 (OR ALGEBRA I)	0.00	.469	.219	.312	0.00	0.00	0.00	0.00	.687	0.00	.687	.469	.219	.312	0.00
	GEOMETRY	0.00	.182	.273	.545	0.00	0.00	0.00	0.00	.455	0.00	.455	.182	.273	.545	0.00

1 MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
SUBTOPIC BY SUBTOPIC (97 CATEGORIES), PERCENTAGE

SUBTOPIC	COURSE	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
SUBTOPIC MEAN		.250	.353	.244	.141	.013	0.00	0.00	0.00	.846	.250	.596	.603	.244	.141	.013
CONV. BET. FRACTIONS & PERCENT	LOWER THAN PRE-ALGEBRA	.465	.419	.070	0.00	.047	0.00	0.00	0.00	.953	.465	.488	.884	.070	0.00	.047
	MATH A OR MATH B	.400	.400	.200	0.00	0.00	0.00	0.00	0.00	1.00	.400	.600	.800	.200	0.00	0.00
	PRE-ALGEBRA	.282	.256	.462	0.00	0.00	0.00	0.00	0.00	1.00	.282	.718	.538	.462	0.00	0.00
	ALGEBRA 1,2 (OR ALGEBRA I)	0.00	.469	.219	.312	0.00	0.00	0.00	0.00	.687	0.00	.687	.469	.219	.312	0.00
	GEOMETRY	0.00	.182	.182	.636	0.00	0.00	0.00	0.00	.364	0.00	.364	.182	.182	.636	0.00
SUBTOPIC MEAN		.250	.353	.231	.154	.013	0.00	0.00	0.00	.833	.250	.583	.603	.231	.154	.013
COMPUT. WITH DECI & FRAC, ROUND.	LOWER THAN PRE-ALGEBRA	.465	.419	.116	0.00	0.00	0.00	0.00	0.00	1.00	.465	.535	.884	.116	0.00	0.00
	MATH A OR MATH B	.400	.400	.200	0.00	0.00	0.00	0.00	0.00	1.00	.400	.600	.800	.200	0.00	0.00
	PRE-ALGEBRA	.282	.256	.462	0.00	0.00	0.00	0.00	0.00	1.00	.282	.718	.538	.462	0.00	0.00
	ALGEBRA 1,2 (OR ALGEBRA I)	0.00	.406	.281	.312	0.00	0.00	0.00	0.00	.687	0.00	.687	.406	.281	.312	0.00
	GEOMETRY	0.00	.182	.273	.545	0.00	0.00	0.00	0.00	.455	0.00	.455	.182	.273	.545	0.00
SUBTOPIC MEAN		.250	.340	.269	.141	0.00	0.00	0.00	0.00	.859	.250	.609	.590	.269	.141	0.00
COMPUTATION OF PERCENT	LOWER THAN PRE-ALGEBRA	.581	.302	0.00	0.00	.070	0.00	.047	0.00	.884	.581	.302	.884	0.00	0.00	.116
	MATH A OR MATH B	.300	.200	.150	0.00	.150	0.00	0.00	.200	.650	.300	.350	.500	.150	0.00	.350
	PRE-ALGEBRA	.308	.513	.179	0.00	0.00	0.00	0.00	0.00	1.00	.308	.692	.821	.179	0.00	0.00
	ALGEBRA 1,2 (OR ALGEBRA I)	.312	.219	.281	.187	0.00	0.00	0.00	0.00	.812	.312	.500	.531	.281	.187	0.00
	GEOMETRY	0.00	.227	.273	.500	0.00	0.00	0.00	0.00	.500	0.00	.500	.227	.273	.500	0.00
SUBTOPIC MEAN		.340	.314	.160	.109	.038	0.00	.013	.026	.814	.340	.474	.654	.160	.109	.077
CONCEPT OF PROPORTION	LOWER THAN PRE-ALGEBRA	.605	.209	.023	0.00	.116	0.00	.047	0.00	.837	.605	.233	.814	.023	0.00	.163
	MATH A OR MATH B	.450	.050	.150	0.00	.150	0.00	0.00	.200	.650	.450	.200	.500	.150	0.00	.350
	PRE-ALGEBRA	.333	.513	.154	0.00	0.00	0.00	0.00	0.00	1.00	.333	.667	.846	.154	0.00	0.00
	ALGEBRA 1,2 (OR ALGEBRA I)	.375	.375	.219	.031	0.00	0.00	0.00	0.00	.969	.375	.594	.750	.219	.031	0.00

		A	B	C	D	E	F	G	M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
		NDED	EWED	MED		HT L ATER	IN C URRI	KNOW	ING	A+B +C						E +F +G +M
POWERS OF 10 & SCIENTIFIC NOTAT.	ALGEBRA 1,2 (OR ALGEBRA I)	.687	.219	0.00	.062	0.00	0.00	0.00	.031	.906	.687	.219	.906	0.00	.062	.031
	GEOMETRY	0.00	.227	.273	.409	.045	.045	0.00	0.00	.500	0.00	.500	.227	.273	.409	.091
SUBTOPIC MEAN		.385	.224	.064	.090	.122	.032	.038	.045	.673	.385	.288	.609	.064	.090	.237
EXPONENT. WITH INTEGRAL EXPONEN.	LOWER THAN PRE-ALGEBRA	.233	.163	.070	0.00	.372	.070	.047	.047	.465	.233	.233	.395	.070	0.00	.535
	MATH A OR MATH B	.350	0.00	0.00	0.00	.150	0.00	.300	.200	.350	.350	0.00	.350	0.00	0.00	.650
	PRE-ALGEBRA	.513	.282	.026	0.00	.128	.051	0.00	0.00	.821	.513	.308	.795	.026	0.00	.179
	ALGEBRA 1,2 (OR ALGEBRA I)	.781	.125	0.00	0.00	.062	0.00	0.00	.031	.906	.781	.125	.906	0.00	0.00	.094
	GEOMETRY	0.00	.227	.409	.318	0.00	.045	0.00	0.00	.636	0.00	.636	.227	.409	.318	.045
SUBTOPIC MEAN		.397	.173	.083	.045	.167	.038	.051	.045	.654	.397	.256	.571	.083	.045	.301
SQ. ROOT OF PERFECT SQUARES	LOWER THAN PRE-ALGEBRA	.233	.116	0.00	0.00	.442	.116	.047	.047	.349	.233	.116	.349	0.00	0.00	.651
	MATH A OR MATH B	.400	.150	0.00	.150	.300	0.00	0.00	0.00	.550	.400	.150	.550	0.00	.150	.300
	PRE-ALGEBRA	.769	0.00	.026	0.00	.205	0.00	0.00	0.00	.795	.769	.026	.769	.026	0.00	.205
	ALGEBRA 1,2 (OR ALGEBRA I)	.625	.219	.094	0.00	.062	0.00	0.00	0.00	.937	.625	.312	.844	.094	0.00	.062
	GEOMETRY	.091	.318	.364	.227	0.00	0.00	0.00	0.00	.773	.091	.682	.409	.364	.227	0.00
SUBTOPIC MEAN		.449	.141	.077	.051	.224	.032	.013	.013	.667	.449	.218	.590	.077	.051	.282
SIMPLIFICATION OF SQ. ROOTS	LOWER THAN PRE-ALGEBRA	.209	.116	0.00	0.00	.442	.140	.047	.047	.326	.209	.116	.326	0.00	0.00	.674
	MATH A OR MATH B	.300	.150	0.00	.150	.300	0.00	0.00	.100	.450	.300	.150	.450	0.00	.150	.400
	PRE-ALGEBRA	.641	0.00	.026	0.00	.282	.051	0.00	0.00	.667	.641	.026	.641	.026	0.00	.333
	ALGEBRA 1,2 (OR ALGEBRA I)	.750	.062	.062	0.00	.125	0.00	0.00	0.00	.875	.750	.125	.812	.062	0.00	.125
	GEOMETRY	.091	.318	.409	.182	0.00	0.00	0.00	0.00	.818	.091	.727	.409	.409	.182	0.00
SUBTOPIC MEAN		.423	.109	.077	.045	.256	.051	.013	.026	.609	.423	.186	.532	.077	.045	.346
ADD. & SUB. OF SQ. ROOTS	LOWER THAN PRE-ALGEBRA	.163	.093	0.00	0.00	.465	.186	.047	.047	.256	.163	.093	.256	0.00	0.00	.744

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MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
SUBTOPIC BY SUBTOPIC (97 CATEGORIES), PERCENTAGE

SUBTOPIC	COURSE	A	B	C	D	E	F	G	M	A+B +C	A	B+C	A+B	C	D	E +F +G +M
		NEW	EXTE NDED	REVI EWED	ASSU MED	TAUG HT L ATER	NOT IN C URRI	NOT KNOW	MISS ING							E

ADD. & SUB. OF SQ. ROOTS	MATH A OR MATH B	.300	.150	0.00	.150	.300	0.00	0.00	.100	.450	.300	.150	.450	0.00	.150	.400
	PRE-ALGEBRA	.667	0.00	.026	0.00	.231	.077	0.00	0.00	.692	.667	.026	.667	.026	0.00	.308
	ALGEBRA 1,2 (OR ALGEBRA I)	.687	.125	.062	0.00	.125	0.00	0.00	0.00	.875	.687	.187	.812	.062	0.00	.125
	GEOMETRY	.091	.318	.318	.273	0.00	0.00	0.00	0.00	.727	.091	.636	.409	.318	.273	0.00
SUBTOPIC MEAN		.404	.115	.064	.058	.250	.071	.013	.026	.583	.404	.179	.519	.064	.058	.359
MUL. & DIV. OF SQ. ROOTS	LOWER THAN PRE-ALGEBRA	.163	.093	0.00	0.00	.465	.186	.047	.047	.256	.163	.093	.256	0.00	0.00	.744
	MATH A OR MATH B	.300	.150	0.00	.150	.300	0.00	0.00	.100	.450	.300	.150	.450	0.00	.150	.400
	PRE-ALGEBRA	.615	0.00	.026	0.00	.282	.077	0.00	0.00	.641	.615	.026	.615	.026	0.00	.359
	ALGEBRA 1,2 (OR ALGEBRA I)	.687	.125	.062	0.00	.125	0.00	0.00	0.00	.875	.687	.187	.812	.062	0.00	.125
	GEOMETRY	.091	.318	.409	.182	0.00	0.00	0.00	0.00	.818	.091	.727	.409	.409	.182	0.00
SUBTOPIC MEAN		.391	.115	.077	.045	.263	.071	.013	.026	.583	.391	.192	.506	.077	.045	.372
CONV. BET. RADICALS & RAT. EXPO.	LOWER THAN PRE-ALGEBRA	.093	0.00	0.00	0.00	.558	.233	0.00	.116	.093	.093	0.00	.093	0.00	0.00	.907
	MATH A OR MATH B	.050	0.00	0.00	0.00	.450	.200	0.00	.300	.050	.050	0.00	.050	0.00	0.00	.950
	PRE-ALGEBRA	.538	0.00	0.00	0.00	.333	.128	0.00	0.00	.538	.538	0.00	.538	0.00	0.00	.462
	ALGEBRA 1,2 (OR ALGEBRA I)	.781	0.00	0.00	0.00	.219	0.00	0.00	0.00	.781	.781	0.00	.781	0.00	0.00	.219
	GEOMETRY	.227	.136	.318	.045	.136	.045	.091	0.00	.682	.227	.455	.364	.318	.045	.273
SUBTOPIC MEAN		.359	.019	.045	.006	.359	.128	.013	.071	.423	.359	.064	.378	.045	.006	.571
RATIONALIZ. OF NUMERA. & DENOMI.	LOWER THAN PRE-ALGEBRA	.093	0.00	0.00	0.00	.558	.233	0.00	.116	.093	.093	0.00	.093	0.00	0.00	.907
	MATH A OR MATH B	.050	0.00	0.00	0.00	.450	.200	0.00	.300	.050	.050	0.00	.050	0.00	0.00	.950
	PRE-ALGEBRA	.487	0.00	0.00	0.00	.333	.179	0.00	0.00	.487	.487	0.00	.487	0.00	0.00	.513
	ALGEBRA 1,2 (OR ALGEBRA I)	.781	0.00	0.00	0.00	.219	0.00	0.00	0.00	.781	.781	0.00	.781	0.00	0.00	.219
	GEOMETRY	.273	.182	.409	.045	0.00	0.00	.091	0.00	.864	.273	.591	.455	.409	.045	.091
SUBTOPIC MEAN		.353	.026	.058	.006	.340	.135	.013	.071	.436	.353	.083	.378	.058	.006	.558

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
SUBTOPIC BY SUBTOPIC (97 CATEGORIES), PERCENTAGE

SUBTOPIC	COURSE	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
ADD. AND SUB. OF RADICAL EXPRE.	LOWER THAN PRE-ALGEBRA	.093	0.00	0.00	0.00	.558	.233	0.00	.116	.093	.093	0.00	.093	0.00	0.00	.907
	MATH A OR MATH B	.050	0.00	0.00	0.00	.450	.200	0.00	.300	.050	.050	0.00	.050	0.00	0.00	.950

	PRE-ALGEBRA	.410	0.00	0.00	0.00	.410	.179	0.00	0.00	.410	.410	0.00	.410	0.00	0.00	.590
	ALGEBRA 1,2 (OR ALGEBRA I)	.781	0.00	0.00	0.00	.219	0.00	0.00	0.00	.781	.781	0.00	.781	0.00	0.00	.219
	GEOMETRY	.273	.045	.318	.045	.136	.091	.091	0.00	.636	.273	.364	.318	.318	.045	.318
SUBTOPIC MEAN		.333	.006	.045	.006	.378	.147	.013	.071	.385	.333	.051	.340	.045	.006	.609
NUM. CALCU. W/ EXPONENTS & RAD.	LOWER THAN PRE-ALGEBRA	.093	0.00	0.00	0.00	.558	.233	0.00	.116	.093	.093	0.00	.093	0.00	0.00	.907
	MATH A OR MATH B	.200	0.00	0.00	0.00	.300	.200	0.00	.300	.200	.200	0.00	.200	0.00	0.00	.800
	PRE-ALGEBRA	.487	0.00	0.00	0.00	.333	.179	0.00	0.00	.487	.487	0.00	.487	0.00	0.00	.513
	ALGEBRA 1,2 (OR ALGEBRA I)	.781	0.00	0.00	0.00	.219	0.00	0.00	0.00	.781	.781	0.00	.781	0.00	0.00	.219
	GEOMETRY	.273	.182	.318	.045	.091	0.00	.091	0.00	.773	.273	.500	.455	.318	.045	.182
SUBTOPIC MEAN		.372	.026	.045	.006	.333	.135	.013	.071	.442	.372	.071	.397	.045	.006	.551
ALGE. CALCU. W/ EXPONENTS & RAD.	LOWER THAN PRE-ALGEBRA	.093	0.00	0.00	0.00	.558	.233	0.00	.116	.093	.093	0.00	.093	0.00	0.00	.907
	MATH A OR MATH B	.200	0.00	0.00	0.00	.300	.200	0.00	.300	.200	.200	0.00	.200	0.00	0.00	.800
	PRE-ALGEBRA	.205	0.00	0.00	0.00	.615	.179	0.00	0.00	.205	.205	0.00	.205	0.00	0.00	.795
	ALGEBRA 1,2 (OR ALGEBRA I)	.781	0.00	0.00	0.00	.219	0.00	0.00	0.00	.781	.781	0.00	.781	0.00	0.00	.219
	GEOMETRY	.227	.136	.318	.045	.136	.045	.091	0.00	.682	.227	.455	.364	.318	.045	.273
SUBTOPIC MEAN		.295	.019	.045	.006	.410	.141	.013	.071	.359	.295	.064	.314	.045	.006	.635
FACTORING & SIMPLI. ALGE. EXPRE.	LOWER THAN PRE-ALGEBRA	0.00	.093	0.00	0.00	.558	.233	0.00	.116	.093	0.00	.093	.093	0.00	0.00	.907
	MATH A OR MATH B	.150	0.00	0.00	0.00	.350	.200	0.00	.300	.150	.150	0.00	.150	0.00	0.00	.850
	PRE-ALGEBRA	.128	0.00	0.00	0.00	.692	.179	0.00	0.00	.128	.128	0.00	.128	0.00	0.00	.872
	ALGEBRA 1,2 (OR ALGEBRA I)	.781	0.00	0.00	0.00	.219	0.00	0.00	0.00	.781	.781	0.00	.781	0.00	0.00	.219
	GEOMETRY	.182	.091	.318	.045	.227	.045	.091	0.00	.591	.182	.409	.273	.318	.045	.364

1 MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
SUBTOPIC BY SUBTOPIC (97 CATEGORIES), PERCENTAGE

SUBTOPIC	COURSE	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
SUBTOPIC MEAN		.237	.038	.045	.006	.449	.141	.013	.071	.321	.237	.083	.276	.045	.006	.673
ESTIM. & APPROXI. WITH RADICALS.	LOWER THAN PRE-ALGEBRA	.093	0.00	0.00	0.00	.558	.233	0.00	.116	.093	.093	0.00	.093	0.00	0.00	.907
	MATH A OR MATH B	.050	0.00	0.00	0.00	.300	.200	.150	.300	.050	.050	0.00	.050	0.00	0.00	.950
	PRE-ALGEBRA	.231	0.00	0.00	0.00	.590	.179	0.00	0.00	.231	.231	0.00	.231	0.00	0.00	.769

	GEOMETRY	.045	.182	.364	.318	0.00	0.00	.091	0.00	.591	.045	.545	.227	.364	.318	.091
SUBTOPIC MEAN		.327	.058	.051	.045	.314	.122	.013	.071	.436	.327	.109	.385	.051	.045	.519
MUL. OF MONOMIAL WITH A POLYNO.	LOWER THAN PRE-ALGEBRA	.093	0.00	0.00	0.00	.535	.256	0.00	.116	.093	.093	0.00	.093	0.00	0.00	.907
	MATH A OR MATH B	.350	0.00	0.00	0.00	.150	.200	0.00	.300	.350	.350	0.00	.350	0.00	0.00	.650
	PRE-ALGEBRA	.256	0.00	0.00	0.00	.590	.154	0.00	0.00	.256	.256	0.00	.256	0.00	0.00	.744
	ALGEBRA 1,2 (OR ALGEBRA I)	.844	.156	0.00	0.00	0.00	0.00	0.00	0.00	1.00	.844	.156	1.00	0.00	0.00	0.00
	GEOMETRY	.045	.182	.364	.227	.091	0.00	.091	0.00	.591	.045	.545	.227	.364	.227	.182
SUBTOPIC MEAN		.314	.058	.051	.032	.327	.135	.013	.071	.423	.314	.109	.372	.051	.032	.545
MUL. OF TWO BINOMIALS	LOWER THAN PRE-ALGEBRA	.093	0.00	0.00	0.00	.535	.256	0.00	.116	.093	.093	0.00	.093	0.00	0.00	.907
	MATH A OR MATH B	.200	0.00	0.00	0.00	.300	.200	0.00	.300	.200	.200	0.00	.200	0.00	0.00	.800
	PRE-ALGEBRA	.154	0.00	0.00	0.00	.692	.154	0.00	0.00	.154	.154	0.00	.154	0.00	0.00	.846
	ALGEBRA 1,2 (OR ALGEBRA I)	.844	.156	0.00	0.00	0.00	0.00	0.00	0.00	1.00	.844	.156	1.00	0.00	0.00	0.00
	GEOMETRY	.045	.182	.364	.227	.091	0.00	.091	0.00	.591	.045	.545	.227	.364	.227	.182
SUBTOPIC MEAN		.269	.058	.051	.032	.372	.135	.013	.071	.378	.269	.109	.327	.051	.032	.590
DIVISION OF POLYNOMIALS	LOWER THAN PRE-ALGEBRA	.093	0.00	0.00	0.00	.535	.256	0.00	.116	.093	.093	0.00	.093	0.00	0.00	.907
	MATH A OR MATH B	.350	0.00	0.00	0.00	.150	.200	0.00	.300	.350	.350	0.00	.350	0.00	0.00	.650
	PRE-ALGEBRA	.077	0.00	0.00	0.00	.769	.154	0.00	0.00	.077	.077	0.00	.077	0.00	0.00	.923

MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
SUBTOPIC BY SUBTOPIC (97 CATEGORIES), PERCENTAGE

SUBTOPIC	COURSE	NEW	EXTENDED	REVIEWED	ASSUMED	TAUGHT LATER	NOT IN CURRI	NOT KNOW	MISSING						
		A	B	C	D	E	F	G	M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
DIVISION OF POLYNOMIALS	ALGEBRA 1,2 (OR ALGEBRA I)	.906	.062	0.00	0.00	.031	0.00	0.00	0.00	.969	.906	.062	.969	0.00	0.00	.031
	GEOMETRY	.045	.182	.273	.227	.182	0.00	.091	0.00	.500	.045	.455	.227	.273	.227	.273
SUBTOPIC MEAN		.282	.038	.038	.032	.391	.135	.013	.071	.359	.282	.077	.321	.038	.032	.609
SQUARING A BINOMIAL	LOWER THAN PRE-ALGEBRA	.093	0.00	0.00	0.00	.535	.256	0.00	.116	.093	.093	0.00	.093	0.00	0.00	.907
	MATH A OR MATH B	.200	0.00	0.00	0.00	.300	.200	0.00	.300	.200	.200	0.00	.200	0.00	0.00	.800
	PRE-ALGEBRA	.077	0.00	0.00	0.00	.769	.154	0.00	0.00	.077	.077	0.00	.077	0.00	0.00	.923
	ALGEBRA 1,2 (OR ALGEBRA I)	.906	.062	0.00	0.00	.031	0.00	0.00	0.00	.969	.906	.062	.969	0.00	0.00	.031
	GEOMETRY	.045	.182	.455	.227	0.00	0.00	.091	0.00	.682	.045	.636	.227	.455	.227	.091

ONE UNKNOWN WITH NUM. COEFFI.	LOWER THAN PRE-ALGEBRA	.256	0.00	0.00	0.00	.419	.209	0.00	.116	.256	.256	0.00	.256	0.00	0.00	.744
	MATH A OR MATH B	.350	0.00	0.00	0.00	.150	.200	0.00	.300	.350	.350	0.00	.350	0.00	0.00	.650
	PRE-ALGEBRA	.436	.051	0.00	0.00	.487	.026	0.00	0.00	.487	.436	.051	.487	0.00	0.00	.513
	ALGEBRA 1,2 (OR ALGEBRA I)	.812	.187	0.00	0.00	0.00	0.00	0.00	0.00	1.00	.812	.187	1.00	0.00	0.00	0.00
	GEOMETRY	.045	.182	.227	.455	0.00	0.00	.091	0.00	.455	.045	.409	.227	.227	.455	.091
SUBTOPIC MEAN		.397	.077	.032	.064	.256	.090	.013	.071	.506	.397	.109	.474	.032	.064	.429
ONE UNKNOWN WITH LIT. COEFFI.	LOWER THAN PRE-ALGEBRA	.233	0.00	0.00	0.00	.442	.209	0.00	.116	.233	.233	0.00	.233	0.00	0.00	.767
	MATH A OR MATH B	.350	0.00	0.00	0.00	.150	.200	0.00	.300	.350	.350	0.00	.350	0.00	0.00	.650
	PRE-ALGEBRA	.333	.051	0.00	0.00	.590	.026	0.00	0.00	.385	.333	.051	.385	0.00	0.00	.615
	ALGEBRA 1,2 (OR ALGEBRA I)	.812	.187	0.00	0.00	0.00	0.00	0.00	0.00	1.00	.812	.187	1.00	0.00	0.00	0.00
	GEOMETRY	.045	.182	.136	.455	.091	0.00	.091	0.00	.364	.045	.318	.227	.136	.455	.182
SUBTOPIC MEAN		.365	.077	.019	.064	.301	.090	.013	.071	.462	.365	.096	.442	.019	.064	.474
SIMPLE LIN. EQUA. IN ONE UNKNOWN	LOWER THAN PRE-ALGEBRA	.279	0.00	0.00	0.00	.419	.186	0.00	.116	.279	.279	0.00	.279	0.00	0.00	.721

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MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
SUBTOPIC BY SUBTOPIC (97 CATEGORIES), PERCENTAGE

SUBTOPIC	COURSE	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
SIMPLE LIN. EQUA. IN ONE UNKNOWN	MATH A OR MATH B	.350	0.00	0.00	0.00	.150	.200	0.00	.300	.350	.350	0.00	.350	0.00	0.00	.650
	PRE-ALGEBRA	.436	.051	0.00	0.00	.487	.026	0.00	0.00	.487	.436	.051	.487	0.00	0.00	.513
	ALGEBRA 1,2 (OR ALGEBRA I)	.812	.187	0.00	0.00	0.00	0.00	0.00	0.00	1.00	.812	.187	1.00	0.00	0.00	0.00
	GEOMETRY	.045	.182	.227	.455	0.00	0.00	.091	0.00	.455	.045	.409	.227	.227	.455	.091
SUBTOPIC MEAN		.404	.077	.032	.064	.256	.083	.013	.071	.513	.404	.109	.481	.032	.064	.423
TWO UNKNOWN BY ELIMINATION	LOWER THAN PRE-ALGEBRA	.093	0.00	0.00	0.00	.535	.256	0.00	.116	.093	.093	0.00	.093	0.00	0.00	.907
	MATH A OR MATH B	.050	0.00	0.00	0.00	.450	.200	0.00	.300	.050	.050	0.00	.050	0.00	0.00	.950
	PRE-ALGEBRA	.256	0.00	0.00	0.00	.538	.077	.077	.051	.256	.256	0.00	.256	0.00	0.00	.744
	ALGEBRA 1,2 (OR ALGEBRA I)	.969	0.00	0.00	0.00	.031	0.00	0.00	0.00	.969	.969	0.00	.969	0.00	0.00	.031
	GEOMETRY	.045	.182	.318	.364	0.00	0.00	.091	0.00	.545	.045	.500	.227	.318	.364	.091
SUBTOPIC MEAN		.301	.026	.045	.051	.346	.115	.032	.083	.372	.301	.071	.327	.045	.051	.577
TWO UNKNOWN BY	LOWER THAN PRE-ALGEBRA	.093	0.00	0.00	0.00	.535	.256	0.00	.116	.093	.093	0.00	.093	0.00	0.00	.907

	MATH A OR MATH B	.050	0.00	0.00	0.00	.450	.200	0.00	.300	.050	.050	0.00	.050	0.00	0.00	.950
	PRE-ALGEBRA	0.00	0.00	0.00	0.00	.744	.256	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	ALGEBRA 1,2 (OR ALGEBRA I)	.875	0.00	0.00	0.00	.125	0.00	0.00	0.00	.875	.875	0.00	.875	0.00	0.00	.125
	GEOMETRY	0.00	.273	.364	.227	0.00	.091	0.00	.045	.636	0.00	.636	.273	.364	.227	.136
SUBTOPIC MEAN		.186	.038	.051	.032	.417	.173	0.00	.103	.276	.186	.090	.224	.051	.032	.692
SOLV. QUAD. EQUA. BY QUADRATIC	LOWER THAN PRE-ALGEBRA	0.00	0.00	0.00	0.00	.535	.256	0.00	.209	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	MATH A OR MATH B	0.00	0.00	0.00	0.00	.500	.200	0.00	.300	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	PRE-ALGEBRA	0.00	0.00	0.00	0.00	.744	.256	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	ALGEBRA 1,2 (OR ALGEBRA I)	.875	0.00	0.00	0.00	.125	0.00	0.00	0.00	.875	.875	0.00	.875	0.00	0.00	.125

1 MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
SUBTOPIC BY SUBTOPIC (97 CATEGORIES), PERCENTAGE

SUBTOPIC	COURSE	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
SOLV. QUAD. EQUA. BY QUADRATIC	GEOMETRY	0.00	.182	.273	.227	.091	.091	0.00	.136	.455	0.00	.455	.182	.273	.227	.318
SUBTOPIC MEAN		.179	.026	.038	.032	.436	.173	0.00	.115	.244	.179	.064	.205	.038	.032	.724
GRAPHS OF QUADRATIC RELATIONS	LOWER THAN PRE-ALGEBRA	0.00	0.00	0.00	0.00	.535	.256	0.00	.209	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	MATH A OR MATH B	0.00	0.00	0.00	0.00	.500	.200	0.00	.300	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	PRE-ALGEBRA	0.00	0.00	0.00	0.00	.744	.256	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	ALGEBRA 1,2 (OR ALGEBRA I)	.594	0.00	0.00	0.00	.406	0.00	0.00	0.00	.594	.594	0.00	.594	0.00	0.00	.406
	GEOMETRY	0.00	.045	.227	.318	.273	.091	0.00	.045	.273	0.00	.273	.045	.227	.318	.409
SUBTOPIC MEAN		.122	.006	.032	.045	.519	.173	0.00	.103	.160	.122	.038	.128	.032	.045	.795
ONE UNKNOWN WITH NUM. COEFFI.	LOWER THAN PRE-ALGEBRA	0.00	0.00	0.00	0.00	.535	.256	0.00	.209	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	MATH A OR MATH B	.350	0.00	0.00	0.00	.150	.200	0.00	.300	.350	.350	0.00	.350	0.00	0.00	.650
	PRE-ALGEBRA	.462	0.00	0.00	0.00	.462	.077	0.00	0.00	.462	.462	0.00	.462	0.00	0.00	.538
	ALGEBRA 1,2 (OR ALGEBRA I)	.844	.156	0.00	0.00	0.00	0.00	0.00	0.00	1.00	.844	.156	1.00	0.00	0.00	0.00
	GEOMETRY	0.00	.182	.182	.500	0.00	.091	0.00	.045	.364	0.00	.364	.182	.182	.500	.136
SUBTOPIC MEAN		.333	.058	.026	.071	.282	.128	0.00	.103	.417	.333	.083	.391	.026	.071	.513
SOLUT. OF QUADRATIC INEQUALITIES	LOWER THAN PRE-ALGEBRA	0.00	0.00	0.00	0.00	.535	.256	0.00	.209	0.00	0.00	0.00	0.00	0.00	0.00	1.00

	MATH A OR MATH B	.350	0.00	0.00	0.00	.150	.200	0.00	.300	.350	.350	0.00	.350	0.00	0.00	.650
	PRE-ALGEBRA	.487	0.00	0.00	0.00	.359	.154	0.00	0.00	.487	.487	0.00	.487	0.00	0.00	.513
	ALGEBRA 1,2 (OR ALGEBRA I)	.844	.094	0.00	0.00	.062	0.00	0.00	0.00	.937	.844	.094	.937	0.00	0.00	.062
	GEOMETRY	0.00	.182	.227	.455	0.00	.091	0.00	.045	.409	0.00	.409	.182	.227	.455	.136
SUBTOPIC MEAN		.353	.045	.032	.064	.263	.141	0.00	.103	.429	.353	.077	.397	.032	.064	.506

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MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
SUBTOPIC BY SUBTOPIC (97 CATEGORIES), PERCENTAGE

SUBTOPIC	COURSE	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
MUL. & DIV. OF RATIONAL EXPRE.	LOWER THAN PRE-ALGEBRA	.047	0.00	0.00	0.00	.512	.233	0.00	.209	.047	.047	0.00	.047	0.00	0.00	.953
	MATH A OR MATH B	.150	0.00	0.00	0.00	.350	.200	0.00	.300	.150	.150	0.00	.150	0.00	0.00	.850
	PRE-ALGEBRA	.487	0.00	0.00	0.00	.359	.154	0.00	0.00	.487	.487	0.00	.487	0.00	0.00	.513
	ALGEBRA 1,2 (OR ALGEBRA I)	.844	.094	0.00	0.00	.062	0.00	0.00	0.00	.937	.844	.094	.937	0.00	0.00	.062
	GEOMETRY	0.00	.182	.227	.455	0.00	.091	0.00	.045	.409	0.00	.409	.182	.227	.455	.136
SUBTOPIC MEAN		.327	.045	.032	.064	.288	.141	0.00	.103	.404	.327	.077	.372	.032	.064	.532
PROBABILITY	LOWER THAN PRE-ALGEBRA	.209	0.00	0.00	0.00	.372	.163	.047	.209	.209	.209	0.00	.209	0.00	0.00	.791
	MATH A OR MATH B	.500	0.00	0.00	0.00	.200	0.00	0.00	.300	.500	.500	0.00	.500	0.00	0.00	.500
	PRE-ALGEBRA	.077	.385	0.00	0.00	.231	.179	.128	0.00	.462	.077	.385	.462	0.00	0.00	.538
	ALGEBRA 1,2 (OR ALGEBRA I)	.187	.125	0.00	0.00	.687	0.00	0.00	0.00	.312	.187	.125	.312	0.00	0.00	.687
	GEOMETRY	0.00	.091	0.00	0.00	.591	.136	.136	.045	.091	0.00	.091	.091	0.00	0.00	.909
SUBTOPIC MEAN		.179	.135	0.00	0.00	.410	.109	.064	.103	.314	.179	.135	.314	0.00	0.00	.686
DESCRIPTIVE STATISTICS	LOWER THAN PRE-ALGEBRA	.186	0.00	0.00	0.00	.372	.163	.070	.209	.186	.186	0.00	.186	0.00	0.00	.814
	MATH A OR MATH B	.350	0.00	0.00	0.00	.350	0.00	0.00	.300	.350	.350	0.00	.350	0.00	0.00	.650
	PRE-ALGEBRA	.077	.333	0.00	0.00	.231	.179	.179	0.00	.410	.077	.333	.410	0.00	0.00	.590
	ALGEBRA 1,2 (OR ALGEBRA I)	.187	.094	0.00	0.00	.625	0.00	.094	0.00	.281	.187	.094	.281	0.00	0.00	.719
	GEOMETRY	0.00	.091	0.00	0.00	.591	.136	.136	.045	.091	0.00	.091	.091	0.00	0.00	.909
SUBTOPIC MEAN		.154	.115	0.00	0.00	.417	.109	.103	.103	.269	.154	.115	.269	0.00	0.00	.731
GRAPH READING	LOWER THAN PRE-ALGEBRA	.302	.023	0.00	0.00	.465	0.00	0.00	.209	.326	.302	.023	.326	0.00	0.00	.674
	MATH A OR MATH B	.150	.350	0.00	0.00	.200	0.00	0.00	.300	.500	.150	.350	.500	0.00	0.00	.500
	PRE-ALGEBRA	.436	.103	.308	0.00	.154	0.00	0.00	0.00	.846	.436	.410	.538	.308	0.00	.154
	ALGEBRA 1,2 (OR ALGEBRA I)	.531	.281	0.00	.062	.125	0.00	0.00	0.00	.812	.531	.281	.812	0.00	.062	.125

SUBTOPIC BY SUBTOPIC (97 CATEGORIES), PERCENTAGE

SUBTOPIC	COURSE	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
SUBTOPIC MEAN		.385	.192	.115	.026	.179	0.00	0.00	.103	.692	.385	.308	.577	.115	.026	.282
VOL. OF CUBES, CYLINDERS, RECTAN.	LOWER THAN PRE-ALGEBRA	.233	.070	.070	0.00	.395	.023	0.00	.209	.372	.233	.140	.302	.070	0.00	.628
	MATH A OR MATH B	.150	0.00	0.00	0.00	.350	.200	0.00	.300	.150	.150	0.00	.150	0.00	0.00	.850
	PRE-ALGEBRA	.231	.103	.359	0.00	.256	.051	0.00	0.00	.692	.231	.462	.333	.359	0.00	.308
	ALGEBRA 1,2 (OR ALGEBRA I)	.156	.094	.031	.062	.656	0.00	0.00	0.00	.281	.156	.125	.250	.031	.062	.656
	GEOMETRY	.773	.182	0.00	0.00	0.00	0.00	0.00	.045	.955	.773	.182	.955	0.00	0.00	.045
SUBTOPIC MEAN		.282	.090	.115	.013	.353	.045	0.00	.103	.487	.282	.205	.372	.115	.013	.500
FINDING SUM OF INTERIOR ANGLES	LOWER THAN PRE-ALGEBRA	.209	.023	0.00	0.00	.488	.070	0.00	.209	.233	.209	.023	.233	0.00	0.00	.767
	MATH A OR MATH B	0.00	0.00	0.00	0.00	.500	.200	0.00	.300	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	PRE-ALGEBRA	.282	.333	.026	0.00	.231	.128	0.00	0.00	.641	.282	.359	.615	.026	0.00	.359
	ALGEBRA 1,2 (OR ALGEBRA I)	.031	.062	0.00	.062	.844	0.00	0.00	0.00	.094	.031	.062	.094	0.00	.062	.844
	GEOMETRY	.955	0.00	0.00	0.00	0.00	0.00	0.00	.045	.955	.955	0.00	.955	0.00	0.00	.045
SUBTOPIC MEAN		.269	.103	.006	.013	.429	.077	0.00	.103	.378	.269	.109	.372	.006	.013	.609
ISOSCELES & EQUILATERAL TRIANGLE	LOWER THAN PRE-ALGEBRA	.233	.023	0.00	0.00	.488	.047	0.00	.209	.256	.233	.023	.256	0.00	0.00	.744
	MATH A OR MATH B	0.00	0.00	0.00	0.00	.500	.200	0.00	.300	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	PRE-ALGEBRA	.154	.385	.026	0.00	.308	.128	0.00	0.00	.564	.154	.410	.538	.026	0.00	.436
	ALGEBRA 1,2 (OR ALGEBRA I)	.156	0.00	0.00	.125	.719	0.00	0.00	0.00	.156	.156	0.00	.156	0.00	.125	.719
	GEOMETRY	.955	0.00	0.00	0.00	0.00	0.00	0.00	.045	.955	.955	0.00	.955	0.00	0.00	.045
SUBTOPIC MEAN		.269	.103	.006	.026	.423	.071	0.00	.103	.378	.269	.109	.372	.006	.026	.596
APPLIC., CONGRUENT TRIANGLES	LOWER THAN PRE-ALGEBRA	.279	.023	0.00	0.00	.442	.047	0.00	.209	.302	.279	.023	.302	0.00	0.00	.698
	MATH A OR MATH B	0.00	0.00	0.00	0.00	.500	.200	0.00	.300	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	PRE-ALGEBRA	.154	.385	.026	0.00	.308	.128	0.00	0.00	.564	.154	.410	.538	.026	0.00	.436
	ALGEBRA 1,2 (OR ALGEBRA I)	.031	0.00	0.00	.281	.687	0.00	0.00	0.00	.031	.031	0.00	.031	0.00	.281	.687

SUBTOPIC BY SUBTOPIC (97 CATEGORIES), PERCENTAGE

SUBTOPIC	COURSE	NEW	EXTENDED	REVIEWED	ASSUMED	TAUGHT LATER	NOT IN CURRI	NOT KNOW	MISSING	E

PROOFS(FORMAL DEDUCTIVE DEMONST.	PRE-ALGEBRA	0.00	0.00	0.00	0.00	.590	.333	.077	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	ALGEBRA 1,2 (OR ALGEBRA I)	.062	0.00	.062	0.00	.812	.062	0.00	0.00	.125	.062	.062	.062	.062	0.00	.875
	GEOMETRY	.955	0.00	0.00	0.00	0.00	0.00	0.00	.045	.955	.955	0.00	.955	0.00	0.00	.045
SUBTOPIC MEAN		.147	0.00	.032	0.00	.481	.205	.032	.103	.179	.147	.032	.147	.032	0.00	.821
TRANSFORMATIONS(TRANSLATION.	LOWER THAN PRE-ALGEBRA	0.00	0.00	.070	0.00	.372	.302	.047	.209	.070	0.00	.070	0.00	.070	0.00	.930
	MATH A OR MATH B	0.00	0.00	0.00	0.00	.500	.200	0.00	.300	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	PRE-ALGEBRA	0.00	0.00	0.00	0.00	.538	.333	.128	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	ALGEBRA 1,2 (OR ALGEBRA I)	0.00	0.00	.062	0.00	.812	.062	.062	0.00	.062	0.00	.062	0.00	.062	0.00	.937
	GEOMETRY	.364	0.00	0.00	.045	.318	.045	.182	.045	.364	.364	0.00	.364	0.00	.045	.591
SUBTOPIC MEAN		.051	0.00	.032	.006	.513	.212	.083	.103	.083	.051	.032	.051	.032	.006	.910
VECTORS	LOWER THAN PRE-ALGEBRA	0.00	0.00	.070	0.00	.372	.302	.047	.209	.070	0.00	.070	0.00	.070	0.00	.930
	MATH A OR MATH B	0.00	0.00	0.00	0.00	.350	.200	.150	.300	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	PRE-ALGEBRA	0.00	0.00	0.00	0.00	.667	.333	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	ALGEBRA 1,2 (OR ALGEBRA I)	0.00	0.00	.062	0.00	.812	.062	.062	0.00	.062	0.00	.062	0.00	.062	0.00	.937
	GEOMETRY	.364	0.00	0.00	.045	.455	.045	.045	.045	.364	.364	0.00	.364	0.00	.045	.591
SUBTOPIC MEAN		.051	0.00	.032	.006	.545	.212	.051	.103	.083	.051	.032	.051	.032	.006	.910
SIMPLIF. & EVALU. OF EXPRESS.	LOWER THAN PRE-ALGEBRA	0.00	0.00	.070	0.00	.419	.256	.047	.209	.070	0.00	.070	0.00	.070	0.00	.930
	MATH A OR MATH B	.150	0.00	0.00	0.00	.350	.200	0.00	.300	.150	.150	0.00	.150	0.00	0.00	.850
	PRE-ALGEBRA	.692	0.00	0.00	0.00	.282	.026	0.00	0.00	.692	.692	0.00	.692	0.00	0.00	.308
	ALGEBRA 1,2 (OR ALGEBRA I)	.812	.094	0.00	0.00	.031	0.00	.062	0.00	.906	.812	.094	.906	0.00	0.00	.094
	GEOMETRY	.182	.091	.182	.273	.091	.091	.045	.045	.455	.182	.273	.273	.182	.273	.273
SUBTOPIC MEAN		.385	.032	.045	.038	.250	.115	.032	.103	.462	.385	.077	.417	.045	.038	.500
SOLUTION OF EQUATIONS	LOWER THAN PRE-ALGEBRA	0.00	0.00	.070	0.00	.419	.256	.047	.209	.070	0.00	.070	0.00	.070	0.00	.930

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MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
SUBTOPIC BY SUBTOPIC (97 CATEGORIES), PERCENTAGE

SUBTOPIC	COURSE	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B +C	A	B+C	A+B	C	D	E +F+G +M
SOLUTION OF EQUATIONS	MATH A OR MATH B	0.00	0.00	0.00	0.00	.500	.200	0.00	.300	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	PRE-ALGEBRA	.513	0.00	0.00	0.00	.359	.128	0.00	0.00	.513	.513	0.00	.513	0.00	0.00	.487

	GEOMETRY	.091	0.00	.091	.045	.591	.091	.045	.045	.182	.091	.091	.091	.091	.045	.773
SUBTOPIC MEAN		.077	0.00	.026	.006	.494	.256	.038	.103	.103	.077	.026	.077	.026	.006	.891
NUMERICAL FUNCTIONAL EVALUATION	LOWER THAN PRE-ALGEBRA	0.00	0.00	0.00	0.00	.256	.488	.047	.209	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	MATH A OR MATH B	.150	0.00	0.00	0.00	.350	.200	0.00	.300	.150	.150	0.00	.150	0.00	0.00	.850
	PRE-ALGEBRA	0.00	0.00	0.00	0.00	.590	.333	.077	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	ALGEBRA 1,2 (OR ALGEBRA I)	.094	0.00	.062	0.00	.812	.031	0.00	0.00	.156	.094	.062	.094	.062	0.00	.844
	GEOMETRY	.091	0.00	0.00	.045	.773	.045	0.00	.045	.091	.091	0.00	.091	0.00	.045	.864
SUBTOPIC MEAN		.051	0.00	.013	.006	.538	.256	.032	.103	.064	.051	.013	.051	.013	.006	.929
SUBSTITUTING LITERAL EXPRESS.	LOWER THAN PRE-ALGEBRA	0.00	0.00	0.00	0.00	.256	.488	.047	.209	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	MATH A OR MATH B	0.00	0.00	0.00	0.00	.500	.200	0.00	.300	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	PRE-ALGEBRA	0.00	0.00	0.00	0.00	.590	.333	.077	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	ALGEBRA 1,2 (OR ALGEBRA I)	.156	0.00	.062	0.00	.750	.031	0.00	0.00	.219	.156	.062	.156	.062	0.00	.781
	GEOMETRY	.091	0.00	0.00	.045	.773	.045	0.00	.045	.091	.091	0.00	.091	0.00	.045	.864
SUBTOPIC MEAN		.045	0.00	.013	.006	.545	.256	.032	.103	.058	.045	.013	.045	.013	.006	.936
DEFINITION, LAWS & RULES	LOWER THAN PRE-ALGEBRA	0.00	0.00	0.00	0.00	.256	.488	.047	.209	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	MATH A OR MATH B	0.00	0.00	0.00	0.00	.500	.200	0.00	.300	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	PRE-ALGEBRA	0.00	0.00	0.00	0.00	.590	.333	.077	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	ALGEBRA 1,2 (OR ALGEBRA I)	.094	0.00	.062	0.00	.812	.031	0.00	0.00	.156	.094	.062	.094	.062	0.00	.844
	GEOMETRY	.091	0.00	0.00	.045	.773	.045	0.00	.045	.091	.091	0.00	.091	0.00	.045	.864

1 MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
SUBTOPIC BY SUBTOPIC (97 CATEGORIES), PERCENTAGE

SUBTOPIC	COURSE	NEW	EXTENDED	REVIEWED	ASSUMED	TAUGHT LATER	NOT IN CURRI	NOT KNOW	MISSING	A+B+C	A	B+C	A+B	C	D	E+F+G+M
		A	B	C	D	E	F	G	M							
SUBTOPIC MEAN		.032	0.00	.013	.006	.558	.256	.032	.103	.045	.032	.013	.032	.013	.006	.949
INVERSE RELATION BET. LOG. & EXP	LOWER THAN PRE-ALGEBRA	0.00	0.00	0.00	0.00	.256	.488	.047	.209	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	MATH A OR MATH B	0.00	0.00	0.00	0.00	.500	.200	0.00	.300	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	PRE-ALGEBRA	0.00	0.00	0.00	0.00	.590	.333	.077	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	ALGEBRA 1,2 (OR ALGEBRA I)	.094	0.00	.062	0.00	.812	.031	0.00	0.00	.156	.094	.062	.094	.062	0.00	.844
	GEOMETRY	.091	0.00	0.00	.045	.773	.045	0.00	.045	.091	.091	0.00	.091	0.00	.045	.864
SUBTOPIC MEAN		.032	0.00	.013	.006	.558	.256	.032	.103	.045	.032	.013	.032	.013	.006	.949

	MATH A OR MATH B	0.00	0.00	0.00	0.00	.500	.200	0.00	.300	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	PRE-ALGEBRA	.051	0.00	0.00	0.00	.692	.256	0.00	0.00	.051	.051	0.00	.051	0.00	0.00	.949
	ALGEBRA 1,2 (OR ALGEBRA I)	.031	0.00	.062	0.00	.906	0.00	0.00	0.00	.094	.031	.062	.031	.062	0.00	.906
	GEOMETRY	.545	0.00	0.00	.045	.364	0.00	0.00	.045	.545	.545	0.00	.545	0.00	.045	.409
SUBTOPIC MEAN		.096	0.00	.013	.006	.571	.212	0.00	.103	.109	.096	.013	.096	.013	.006	.885
GRAPHING TRIGONOMETRIC FUNCTIONS	LOWER THAN PRE-ALGEBRA	0.00	0.00	0.00	0.00	.349	.442	0.00	.209	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	MATH A OR MATH B	0.00	0.00	0.00	0.00	.500	.200	0.00	.300	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	PRE-ALGEBRA	0.00	0.00	0.00	0.00	.744	.256	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	ALGEBRA 1,2 (OR ALGEBRA I)	0.00	0.00	.062	0.00	.937	0.00	0.00	0.00	.062	0.00	.062	0.00	.062	0.00	.937
	GEOMETRY	.091	0.00	0.00	.045	.773	.045	0.00	.045	.091	.091	0.00	.091	0.00	.045	.864
SUBTOPIC MEAN		.013	0.00	.013	.006	.647	.218	0.00	.103	.026	.013	.013	.013	.013	.006	.968
REDUCING TRIGONOMETRIC EXPRE.	LOWER THAN PRE-ALGEBRA	0.00	0.00	0.00	0.00	.349	.442	0.00	.209	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	MATH A OR MATH B	0.00	0.00	0.00	0.00	.500	.200	0.00	.300	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	PRE-ALGEBRA	0.00	0.00	0.00	0.00	.744	.256	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00

1 MDTP 88 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
SUBTOPIC BY SUBTOPIC (97 CATEGORIES), PERCENTAGE

SUBTOPIC	COURSE	NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	A	B+C	A+B	C	D	E+F+G+M
REDUCING TRIGONOMETRIC EXPRE.	ALGEBRA 1,2 (OR ALGEBRA I)	0.00	0.00	.062	0.00	.937	0.00	0.00	0.00	.062	0.00	.062	0.00	.062	0.00	.937
	GEOMETRY	.091	0.00	0.00	.045	.773	.045	0.00	.045	.091	.091	0.00	.091	0.00	.045	.864
SUBTOPIC MEAN		.013	0.00	.013	.006	.647	.218	0.00	.103	.026	.013	.013	.013	.013	.006	.968
PROOF OF TRIGONOMETRIC IDENTITIE	LOWER THAN PRE-ALGEBRA	0.00	0.00	0.00	0.00	.302	.488	0.00	.209	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	MATH A OR MATH B	0.00	0.00	0.00	0.00	.500	.200	0.00	.300	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	PRE-ALGEBRA	0.00	0.00	0.00	0.00	.667	.333	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	ALGEBRA 1,2 (OR ALGEBRA I)	0.00	0.00	.062	0.00	.906	.031	0.00	0.00	.062	0.00	.062	0.00	.062	0.00	.937
	GEOMETRY	.091	0.00	0.00	.045	.773	.045	0.00	.045	.091	.091	0.00	.091	0.00	.045	.864
SUBTOPIC MEAN		.013	0.00	.013	.006	.609	.256	0.00	.103	.026	.013	.013	.013	.013	.006	.968
GRAND MEAN		.259	.115	.070	.045	.311	.112	.014	.073	.445	.259	.186	.375	.070	.045	.510

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    1  0  DATA LIST FILE=IN RECORD=1
    2  0       /COURSE 9-10 (A) ITEM 12-13 A1 TO A8 15-22
OTHE COMMAND ABOVE READS    1 RECORDS FROM 'IWD6ZCH.TEABEN.TMP'
0           VARIABLE   REC  START    END          FORMAT  WIDTH  DEC

            COURSE       1      9      10          A            2
            ITEM         1     12      13          F            2    0
            A1           1     15      15          F            1    0
            A2           1     16      16          F            1    0
            A3           1     17      17          F            1    0
            A4           1     18      18          F            1    0
            A5           1     19      19          F            1    0
            A6           1     20      20          F            1    0
            A7           1     21      21          F            1    0
            A8           1     22      22          F            1    0
OEND OF DATALIST TABLE
0
    3  0  RECODE COURSE ('51'='29')
    4  0  SELECT IF (COURSE LE '29')
    5  0  COMMENT
    6  0    DATA , MOVED TO THE RIGHT ONE COLUMN, 176*97=17072 CASES
    7  0    07 47 2 01  1 01000000
    8  0    07 47 2 01  2 10000000
    9  0  COMPUTE A9= SUM(A1,A2,A3       )
   10  0  COMPUTE A10=A1
   11  0  COMPUTE A11=SUM(A2,A3          )
   12  0  COMPUTE A12=SUM(A1,A2          )
   13  0  COMPUTE A13=A3
   14  0  COMPUTE A14=A4
   15  0  COMPUTE A15=SUM(A5,A6,A7,A8 )
   16  0  COMPUTE SUB=ITEM
   17  0  RECODE SUB (1  THRU 4 =1  )
   18  0               (5  THRU 18=2  )
   19  0               (19 THRU 32=3  )
   20  0               (33 THRU 44=4  )
   21  0               (45 THRU 55=5  )
   22  0               (56 THRU 58=6  )
   23  0               (59 THRU 62=7  )
   24  0               (63 THRU 64=8  )
126-APR-89   SPSS-X RELEASE 3.0 FOR IBM OS/MVS                              PAGE
 19:07:24     U C L A / O A C              IBM 3090/200      MVS/XA

   25  0               (65 THRU 79=9  )
   26  0               (80 THRU 81=10 )
   27  0               (82 THRU 91=11 )
   28  0               (92 THRU 97=12 )
   29  0  VALUE LABEL COURSE
   30  0                   '01'  'LOWER THAN PRE-ALGEBRA      '
   31  0                   '02'  'MATH A OR MATH B            '
   32  0                   '11'  'PRE-ALGEBRA                 '
   33  0                   '21'  'ALGEBRA 1,2 (OR ALGEBRA I)  '
   34  0                   '31'  'ALGEBRA 3,4 (OR ALGEBRA II)'
   35  0                   '32'  'HONORED ALGEBRA             '
   36  0                   '33'  'ALGEBRA II/TRIGONOMETRY     '
   37  0                   '41'  'PRE CALCULUS                '
   38  0                   '29'  'GEOMETRY                    '
   39  0                   '61'  'TRIGONOMETRY                '/
   40  0              SUB
   41  0                1 '1. INTEGERS      '
   42  0                2 '2. FRACTIONS     '
   43  0                3 '3. EXPONENTS     '
   44  0                4 '4. POLYNOMIALS   '
   45  0                5 '5. ALGEBRAIC EQU.'
```

```
  107  0     54 'SOLV.  QUAD. EQUA. BY QUADRATIC '
  108  0     55 'GRAPHS OF QUADRATIC RELATIONS   '
  109  0     56 'ONE UNKNOWN WITH NUM. COEFFI.   '
  110  0     57 'SOLUT. OF QUADRATIC INEQUALITIES'
  111  0     58 'GRAPHING LIN. INEQ. IN ONE UNKNO'
  112  0     59 'SIMPLIF.  OF A RATIONAL EXPRE.  '
  113  0     60 'EVALUATION OF A RATIONAL EXPRE. '
  114  0     61 'ADD. & SUB. OF RATIONAL EXPRE.  '
  115  0     62 'MUL. & DIV. OF RATIONAL EXPRE.  '
  116  0     63 'PROBABILITY                     '
  117  0     64 'DESCRIPTIVE STATISTICS          '
  118  0     65 'GRAPH READING                   '
  119  0     66 'LOCATI. OF POINTS IN CORD. PLANE'
  120  0     67 'DISTANCE BET. TWO POINTS IN COR.'
  121  0     68 'PERIMETER & AREA OF TRIANGLES,SQ'
  122  0     69 'CIRCUMFERENCE & AREA OF CIRCLE  '
  123  0     70 'VOL. OF CUBES, CYLINDERS,RECTAN.'
  124  0     71 'FINDING SUM OF INTERIOR ANGLES  '
  125  0     72 'ISOSCELES & EQUILATERAL TRIANGLE'
  126  0     73 'APPLIC. , CONGRUENT TRIANGLES   '
  127  0     74 'APPLIC. , SIMPLE TRIANGLES      '
  128  0     75 'PYTHAGOREAN THEOREM & SPECI. TR.'
  129  0     76 'PARALLELISM & PERPENDICULARITY  '
  130  0     77 'PROOFS(FORMAL DEDUCTIVE DEMONST.'
  131  0     78 'TRANSFORMATIONS(TRANSLATION.    '
  132  0     79 'VECTORS                         '
126-APR-89   SPSS-X RELEASE 3.0 FOR IBM OS/MVS                                  PAGE
 19:07:25     U C L A / O A C              IBM 3090/200      MVS/XA

  133  0     80 'SIMPLIF. & EVALU. OF EXPRESS.   '
  134  0     81 'SOLUTION OF EQUATIONS           '
  135  0     82 'FUNCT. CONCEPT & USE OF NOTATION'
  136  0     83 'FUNCT. EVALUATION USING SUBSTIT.'
  137  0     84 'COMPOSITION OF FUNCTION         '
  138  0     85 'GRAPHING OF FUNCTION            '
  139  0     86 'NUMERICAL FUNCTIONAL  EVALUATION'
  140  0     87 'SUBSTITUTING LITERAL EXPRESS.   '
  141  0     88 'DEFINITION, LAWS & RULES        '
  142  0     89 'INVERSE RELATION BET. LOG. & EXP'
  143  0     90 'SOLUTION OF LOG. AND EXP. FUNCT.'
  144  0     91 'GRAPHING OF LOG. AND EXP. FUNCT.'
  145  0     92 'FIND. ALGEBRAIC EXPRESS         '
  146  0     93 'DESCRIB. VARIATIONS OF FUNCTION '
  147  0     94 'FIND. SIDE LENGTHS IN SPEC.TRIA.'
  148  0     95 'GRAPHING TRIGONOMETRIC FUNCTIONS'
  149  0     96 'REDUCING TRIGONOMETRIC EXPRE.   '
  150  0     97 'PROOF OF TRIGONOMETRIC IDENTITIE'
  151  0  SORT CASES BY ITEM COURSE
OSIZE OF FILE TO BE SORTED:     15132 CASES OF     144 BYTES EACH.
 SORT COMPLETED SUCCESSFULLY.  FILE SIZE:      635544 BYTES.
                       MEMORY AVAILABLE:      344746 BYTES.
126-APR-89   SPSS-X RELEASE 3.0 FOR IBM OS/MVS                                  PAGE
 19:07:36     U C L A / O A C              IBM 3090/200      MVS/XA

OPRECEDING TASK REQUIRED       3.03 SECONDS CPU TIME;       10.26 SECONDS ELAPSED.

  152  0  PRINT FORMAT A1 TO A8 A9 TO A15 (F4.3)
  153  0  REPORT FORMAT=MARGINS(1,132) BRKSPACE(-1)
  154  0       /VARIABLES =
  155  0        A1      ' NEW' '    ' '    ' '   A' (4)
  156  0        A2      'EXTE' 'NDED' '    ' '   B' (4)
  157  0        A3      'REVI' 'EWED' '    ' '   C' (4)
  158  0        A4      'ASSU' 'MED ' '    ' '   D' (4)
  159  0        A5      'TAUG' 'HT L' 'ATER' '   E' (4)
```

Figure 4. Average P-values by teachers' reports of topic coverage on the MDTP Algebra Readiness, and Elementary Algebra tests and the SIMS Benchmark test.

Teachers' Report of Topic Coverage	Average P-values (Number of Test Items)*		
	MDTP ALGEBRA READINESS	MDTP ELEMENTARY ALGEBRA	SIMS BENCHMARK
A. Taught as New	.385(50)	.406(46)	.435(39)
B. Extended and Reviewed	.334(46)	.386(47)	.401(39)
C. Reviewed only	.344(43)	.328(50)	.423(32)
D. Assumed as Prereq.	.375(4)	.391(49)	.425(38)
E. Taught Later	.277(35)	.266(32)	.300(37)
F. Not in Curriculum	.366(17)	.128(13)	.318(23)
G. Don't Know	.238(8)	.141(16)	.446(15)
H. No Response	.258(19)	.230(23)	.231(32)

*The average P-value for each response choice is determined by a multi-step process. First, individual test items are assigned to topic categories. Then, the performance of students on each item is assigned to topic coverage categories based on the responses of their teachers. Finally, the P-values for each item that appears in a given topic coverage category are averaged across items. For example, the average p-value for Review Only on the MDTP Algebra Readiness test is .344 across the 43 items where at least one teacher chose "Reviewed Only" to describe the coverage of the topic.

APPENDIX B

Mathematics Diagnostic Testing Project
Teacher Topics Coverage Questionnaire

This questionnaire is part of the ongoing effort to improve the effectiveness of the Mathematics Diagnostics Testing Project. By collecting the information, we will learn more about how mathematics is taught. The information you provide will be kept confidential.

I. Background Information:

Teacher Name _____

School _____

II. Course Descriptions:

Please list below each of the Mathematics courses you teach, (ordered from the lowest to highest level in terms of complexity of mathematics content and student ability) and complete the additional information requested for each class. If you teach the same course at the same student ability level to multiple sections, record the information once only and list all periods in the "period" space below. Note: do **NOT** order them in class period order.

Course 1 (lowest level)

Course Title _____

Text _____

Period(s) _____ Predominate grade levels _____

Type: ○ = Remedial ○ = Typical ○ = Advanced/Honors/Accelerated

Range of material covered: ○ = Very wide ○ = Fairly wide ○ = Fairly narrow ○ = Very narrow

Course 2

Course Title _____

Text _____

Period(s) _____ Predominate grade levels _____

Type: ○ = Remedial ○ = Typical ○ = Advanced/Honors/Accelerated

Range of material covered: ○ = Very wide ○ = Fairly wide ○ = Fairly narrow ○ = Very narrow

Course 3

Course Title _____

Text _____

Period(s) _____ Predominate grade levels _____

Type: ○ = Remedial ○ = Typical ○ = Advanced/Honors/Accelerated

Range of material covered: ○ = Very wide ○ = Fairly wide ○ = Fairly narrow ○ = Very narrow

Course 4

Course Title _____

Text _____

Period(s) _____ Predominate grade levels _____

Type: ○ = Remedial ○ = Typical ○ = Advanced/Honors/Accelerated

Range of material covered: ○ = Very wide ○ = Fairly wide ○ = Fairly narrow ○ = Very narrow

Course 5 (Highest level)

Course Title _____

Text _____

Period(s) _____ Predominate grade levels _____

Type: ○ = Remedial ○ = Typical ○ = Advanced/Honors/Accelerated

Range of material covered: ○ = Very wide ○ = Fairly wide ○ = Fairly narrow ○ = Very narrow

III. Topic Coverage:

The topics given below may be included in your mathematics instructional program. Using the same order of courses listed above, indicate in the appropriate box the response code that corresponds to how the topic was covered in each course. The options are as follows:

a. NEW -- Taught as new content

b. EXTENDED -- Reviewed & extended

c. REVIEW -- Reviewed only

d. ASSUMED -- Assumed as prerequisite knowledge & neither taught nor reviewed

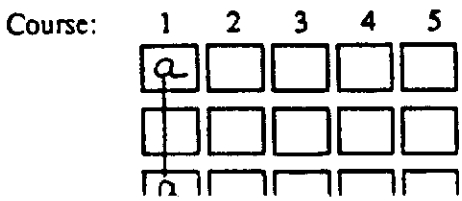
e. TAUGHT LATER -- Taught later in the school curriculum

f. NOT IN CURRICULUM -- Not in the school curriculum

g. DON'T KNOW -- Not taught now and don't know if in school curriculum

h. CAN'T REMEMBER

Note: To save time in completing the task, please do the following:
1) If the responses are the same for any two courses, write "y, x same" at the top of the following page so as not to repeat the same information.
2) If a range of topics have the same code for a class, mark the 1st and last topic with the same code and connect with a straight line, e.g



I. INTEGERS

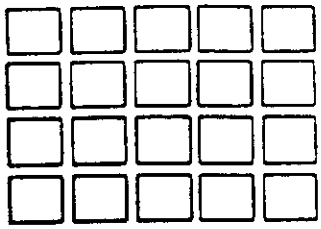
Course: 1 2 3 4 5

. Basic operations with signed numbers

. Prime factorization

. Finding distances on the number line

. Using definition of divisibility



II. FRACTIONS, DECIMALS, PERCENT, RATIO, PROPORTION

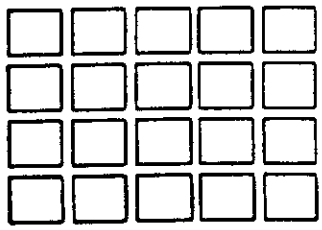
A. **Common Fractions**

. Addition and subtraction of fractions

. Multiplication and division of fractions

. Order and comparison of fractions

. Simplification of complex fractions

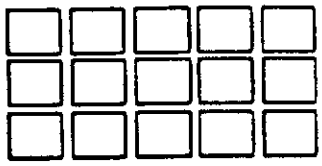


B. **Decimal Fractions**

. Addition and subtraction of decimals

. Multiplication and division of decimals

. Estimation and approximation

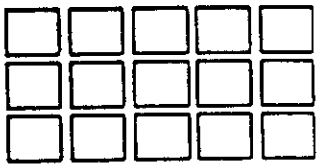


C. **Conversions**

. Conversion between fractions and decimals

. Conversion between fractions and percent

. Computations with both decimals and fractions, rounding off



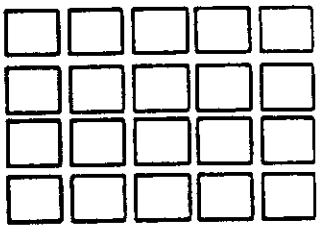
D. **Ratio, Percentage and Proportion**

. Computation of percent

. Concept of proportion

. Computation involving proportions

. Application of rations or proportions



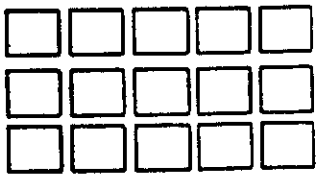
III. EXPONENTS, RADICALS AND SQUARE ROOTS

A. **Exponents**

. Application of laws of exponents

. Powers of 10 and scientific notation

. Exponentiation with integral exponents



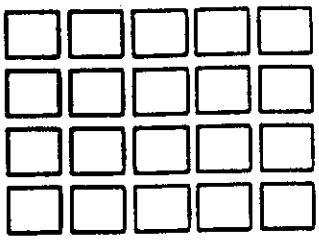
B. **Square Roots**

. Square roots of perfect squares

. Simplification of square roots

. Addition and subtraction of square roots

. Multiplication and division of square roots



KEY: a. NEW b. EXTENDED c. REVIEWED d. ASSUMED e. TAUGHT LATER
f. NOT IN CURRICULUM g. DON'T KNOW h. CAN'T REMEMBER

Course: 1 2 3 4 5

C. Radical and Rational Expressions

. Conversion between radicals and rational exponents

. Rationalization of the denominator

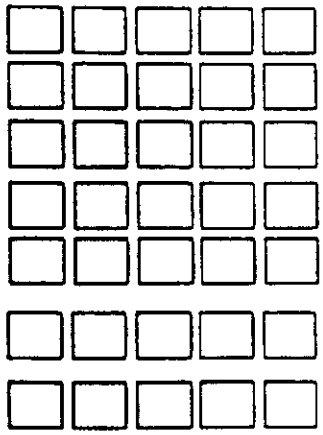
. Addition and subtraction of radical expressions (not just square roots)

. Numerical calculations with exponents and radicals

. Algebraic calculations with rational exponents and radicals

. Factoring and simplifying an algebraic expression involving rational and literal exponents and radicals (not only square roots)

. Estimation and approximation with radicals



IV. POLYNOMIALS

A. Algebraic Operations

. Algebraic operations involving literal symbols

. Simplification of a polynomial by grouping (1 and 2 variables)

. Addition and subtraction of polynomials

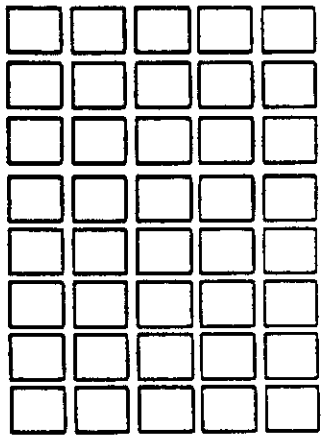
. Evaluation of a polynomial (1 or 2 variables)

. Multiplication of a monomial with a polynomial

. Multiplication of two binomials

. Division of polynomials

. Squaring a binomial $(a+b)^2$, $(a-b)^2$ and $(a+b)(a-b)$



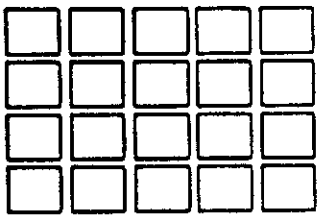
B. Factoring

. Factoring polynomials by finding a common monomial factor

. Factoring a trinomial over the integers

. Factoring perfect square trinomials and differences of square

. Simplification of complex numbers



V. ALGEBRAIC EQUATIONS

A. Linear Equations

. Linear equations in one unknown with numerical coefficients

. Linear equations in one unknown with literal coefficients

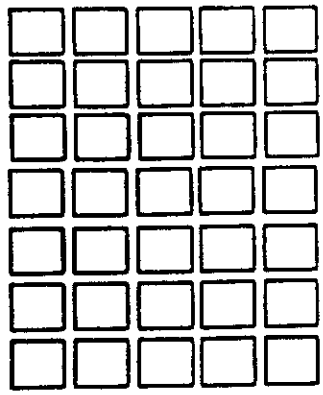
. Simple linear equations in one unknown

. Two linear equations in two unknowns with numerical coefficients- by elimination

. Two linear equations in two unknowns with numerical coefficients- by substitution

.Applications of equations

.Generating equations from problem description



KEY: a. NEW b. EXTENDED c. REVIEWED d. ASSUMED e. TAUGHT LATER
f. NOT IN CURRICULUM g. DON'T KNOW h. CAN'T REMEMBER

Course: 1 2 3 4 5

B. Quadratic Equations

. Solving quadratic equation from factored form

. Solving quadratic equation by factoring

. Solving quadratic equations by quadratic formula

. Graphs of quadratic equations

VI. INEQUALITIES

. Solution of a linear inequality in one unknown with numerical coefficients

. Solution of quadratic inequalities

. Graphing linear inequalities in one unknown

VII. RATIONAL EXPRESSIONS

. Simplification of a rational expression by cancellation of common factors (1 and 2 variables)

. Evaluation of a rational expression (1 and 2 variables)

. Addition and subtraction of rational expressions

. Multiplication and division of rational expressions

VIII. PROBABILITY AND STATISTICS

. Probability

. Descriptive statistics

IX. GEOMETRY

A. Coordinate Plane

. Graph reading (interpretation)

. Location of points in the coordinate plane

. Distance between two points in the coordinate plane

B. Measurement Formulas

. Application of measurement formulas for perimeter and area of triangles, squares, rectangles and parallelograms

. Application of measurement formulas for circumference and area of circles

. Application of measurement formulas for volume of cubes, cylinders, rectangular solids and spheres

C. Properties of Triangles

. Finding the sum of the interior angles of a polygon

. Application of properties of isosceles and equilateral triangle

. Application of properties of congruent triangles

. Application of properties of similar triangles

KEY: a. NEW b. EXTENDED c. REVIEWED d. ASSUMED e. TAUGHT LATER
f. NOT IN CURRICULUM g. DON'T KNOW h. CAN'T REMEMBER

	Course: 1 2 3 4 5
. Application of the Pythagorean theorem and special triangles (45-45-90, 30-60-90)	☐☐☐☐☐
. Application of parallelism and perpendicularity	☐☐☐☐☐
D. Special Topics	
. Proofs (formal deductive demonstrations)	☐☐☐☐☐
. Transformations (translation, reflection, rotations)	☐☐☐☐☐
. Vectors	☐☐☐☐☐
X. ABSOLUTE VALUE(AV)	
. Simplification and evaluation of expressions involving AV	☐☐☐☐☐
. Solution of equations	☐☐☐☐☐
XI. FUNCTIONS	
A. Function Concepts	
. Function concept and use of function notation	☐☐☐☐☐
. Function evaluation using substitution	☐☐☐☐☐
. Composition of function	☐☐☐☐☐
. Graphing of functions including translations, reflections, and absolute value	☐☐☐☐☐
B. Logarithmic and Exponential Functions	
. Numerical function evaluation	☐☐☐☐☐
. Substituting literal expression into function	☐☐☐☐☐
. Definition, laws and rules of logarithms	☐☐☐☐☐
. Inverse relation between the logarithms and exponential function	☐☐☐☐☐
. Solution of logarithmic and exponential equations	☐☐☐☐☐
. Graphing of logarithmic and exponential functions	☐☐☐☐☐
XII. TRIGONOMETRY	
. Finding algebraic expressions for right triangle functions	☐☐☐☐☐
. Describing variations of function values by quadrants	☐☐☐☐☐
. Finding side lengths in special triangles	☐☐☐☐☐
. Graphing trigonometric functions	☐☐☐☐☐
. Reducing trigonometric expressions involving multiples of Pi	☐☐☐☐☐
. Proof of trigonometric identities	☐☐☐☐☐

If there are any other major topics you cover in your class (indicate which class), please indicate in the space below:

Comments or reactions to this survey regarding its content or ease of completion?

APPENDIX C

May 10, 1989

Topic Classification of Test Items

MDTP Algebra Readiness Test

TEST ITEM	TOPIC	SUBTOPIC
ARITEM1	2. FRACTIONS	9. ADD. & SUB OF DECIMALS
ARITEM2	2. FRACTIONS	6. MUL. & DIV. OF FRACTIONS
ARITEM3	2. FRACTIONS	9. ADD. & SUB OF DECIMALS
ARITEM4	4. POLYNOMIALS	36. EVALUATION OF A POLYNOMIAL(1/2)
ARITEM5	1. INTEGERS	1. BASIC OPERATIONS WITH SIGNED NO.
ARITEM6	9. GEOMETRY	65. GRAPH READING
ARITEM7	1. INTEGERS	1. BASIC OPERATIONS WITH SIGNED NO.
ARITEM8	1. INTEGERS	1. BASIC OPERATIONS WITH SIGNED NO.
ARITEM9	1. INTEGERS	3. FINDING DISTANCES ON NUMBER LINE
ARITEM10	2. FRACTIONS	15. COMPUTATION OF PERCENT
ARITEM11	2. FRACTIONS	6. MUL. & DIV. OF FRACTIONS
ARITEM12	1. INTEGERS	2. PRIME FACTORIZATION
ARITEM13	5. ALGEBRAIC EQU.	45. ONE UNKNOWN WITH NUM. COEFFI.
ARITEM14	5. ALGEBRAIC EQU.	45. ONE UNKNOWN WITH NUM. COEFFI.
ARITEM15	4. POLYNOMIALS	36. EVALUATION OF A POLYNOMIAL(1/2)
ARITEM16	2. FRACTIONS	6. MUL. & DIV. OF FRACTIONS
ARITEM17	2. FRACTIONS	10. MUL. & DIV. OF DECIMALS
ARITEM18	2. FRACTIONS	5. ADD. & SUB. OF FRACTIONS
ARITEM19	2. FRACTIONS	6. MUL. & DIV. OF FRACTIONS
ARITEM20	1. INTEGERS	2. PRIME FACTORIZATION
ARITEM21	1. INTEGERS	1. BASIC OPERATIONS WITH SIGNED NO.
ARITEM22	1. INTEGERS	1. BASIC OPERATIONS WITH SIGNED NO.
ARITEM23	3. EXPONENTS	22. SQ. ROOT OF PERFECT SQUARES
ARITEM24	4. POLYNOMIALS	36. EVALUATION OF A POLYNOMIAL(1/2)
ARITEM25	2. FRACTIONS	10. MUL. & DIV. OF DECIMALS
ARITEM26	2. FRACTIONS	13. CONV. BET. FRACTIONS & PERCENT
ARITEM27	1. INTEGERS	1. BASIC OPERATIONS WITH SIGNED NO.
ARITEM28	7. RATIONAL EXPO.	59. SIMPLIF. OF A RATIONAL EXPRE.
ARITEM29	2. FRACTIONS	6. MUL. & DIV. OF FRACTIONS
ARITEM30	2. FRACTIONS	18. APPLIC. OF RATIO OR PROPORTIONS
ARITEM31	2. FRACTIONS	8. SIMPLIF. OF COMPLEX FRACTIONS
ARITEM32	2. FRACTIONS	11. ESTIMATION & APPROXIMATION
ARITEM33	4. POLYNOMIALS	33. ALGE OPERATION OF LITERAL SYMBOL
ARITEM34	3. EXPONENTS	21. EXPONENT. WITH INTEGRAL EXPONEN.
ARITEM35	1. INTEGERS	3. FINDING DISTANCES ON NUMBER LINE
ARITEM36	9. GEOMETRY	66. LOCATI. OF POINTS IN CORD. PLANE
ARITEM37	2. FRACTIONS	7. ORDER & COMPARISON OF FRACTIONS
ARITEM38	9. GEOMETRY	68. PERIMETER & AREA OF TRIANGLES,SQ
ARITEM39	9. GEOMETRY	72. ISOSCELES & EQUILATERAL TRIANGLE
ARITEM40	3. EXPONENTS	20. POWERS OF 10 & SCIENTIFIC NOTAT.
ARITEM41	2. FRACTIONS	7. ORDER & COMPARISON OF FRACTIONS
ARITEM42	2. FRACTIONS	5. ADD. & SUB. OF FRACTIONS
ARITEM43	2. FRACTIONS	5. ADD. & SUB. OF FRACTIONS
ARITEM44	2. FRACTIONS	15. COMPUTATION OF PERCENT
ARITEM45	2. FRACTIONS	14. COMPUT. WITH DECI & FRAC, ROUND.
ARITEM46	9. GEOMETRY	69. CIRCUMFERENCE & AREA OF CIRCLE
ARITEM47	1. INTEGERS	1. BASIC OPERATIONS WITH SIGNED NO.
ARITEM48	3. EXPONENTS	22. SQ. ROOT OF PERFECT SQUARES
ARITEM49	9. GEOMETRY	68. PERIMETER & AREA OF TRIANGLES,SQ
ARITEM50	9. GEOMETRY	74. APPLIC. , SIMPLE TRIANGLES

May 10, 1989

Topic Classification of Test Items

MDTP Elementary Algebra Test

TEST ITEM	TOPIC	SUBTOPIC
EAITEM1	4. POLYNOMIALS	34. SIMPLIF. OF POLYNO. BY GROUPING.
EAITEM2	2. FRACTIONS	12. CONV. BET. FRACTIONS & DECIMALS
EAITEM3	3. EXPONENTS	32. ESTIM. & APPROXI. WITH RADICALS.
EAITEM4	3. EXPONENTS	21. EXPONENT. WITH INTEGRAL EXPONEN.
EAITEM5	2. FRACTIONS	9. ADD. & SUB OF DECIMALS
EAITEM6	4. POLYNOMIALS	40. SQUARING A BINOMIAL
EAITEM7	9. GEOMETRY	72. ISOSCELES & EQUILATERAL TRIANGLE
EAITEM8	3. EXPONENTS	21. EXPONENT. WITH INTEGRAL EXPONEN.
EAITEM9	9. GEOMETRY	66. LOCATI. OF POINTS IN CORD. PLANE
EAITEM10	7. RATIONAL EXPO.	59. SIMPLIF. OF A RATIONAL EXPRE.
EAITEM11	5. ALGEBRAIC EQU.	52. SOLV. EQUA. FROM FACTORED FORM
EAITEM12	4. POLYNOMIALS	37. MUL. OF MONOMIAL WITH A POLYNO.
EAITEM13	4. POLYNOMIALS	42. FACTOR. TRINOMIAL OVER INTEGERS
EAITEM14	4. POLYNOMIALS	36. EVALUATION OF A POLYNOMIAL(1/2)
EAITEM15	2. FRACTIONS	5. ADD. & SUB. OF FRACTIONS
EAITEM16	5. ALGEBRAIC EQU.	48. TWO UNKNOWN BY ELIMINATION
EAITEM17	3. EXPONENTS	22. SQ. ROOT OF PERFECT SQUARES
EAITEM18	9. GEOMETRY	75. PYTHAGOREAN THEOREM & SPECI. TR.
EAITEM19	2. FRACTIONS	6. MUL. & DIV. OF FRACTIONS
EAITEM20	6. INEQUALITIES	58. GRAPHING LIN. INEQ. IN ONE UNKNO
EAITEM21	2. FRACTIONS	15. COMPUTATION OF PERCENT
EAITEM22	3. EXPONENTS	24. ADD. & SUB. OF SQ. ROOTS
EAITEM23	4. POLYNOMIALS	43. FACTOR. PERFECT SQ. TRINOMIALS
EAITEM24	3. EXPONENTS	25. MUL. & DIV. OF SQ. ROOTS
EAITEM25	5. ALGEBRAIC EQU.	50. APPLICATION OF EQUATIONS (should be graph of linear equ.)
EAITEM26	5. ALGEBRAIC EQU.	45. ONE UNKNOWN WITH NUM. COEFFI.
EAITEM27	7. RATIONAL EXPO.	60. EVALUATION OF A RATIONAL EXPRE.
EAITEM28	3. EXPONENTS	23. SIMPLIFICATION OF SQ. ROOTS
EAITEM29	4. POLYNOMIALS	35. ADD. & SUB. OF POLYNOMIALS
EAITEM30	7. RATIONAL EXPO.	59. SIMPLIF. OF A RATIONAL EXPRE.
EAITEM31	9. GEOMETRY	68. PERIMETER & AREA OF TRIANGLES,SQ
EAITEM32	9. GEOMETRY	68. PERIMETER & AREA OF TRIANGLES,SQ
EAITEM33	7. RATIONAL EXPO.	59. SIMPLIF. OF A RATIONAL EXPRE.
EAITEM34	5. ALGEBRAIC EQU.	45. ONE UNKNOWN WITH NUM. COEFFI.
EAITEM35	7. RATIONAL EXPO.	62. MUL. & DIV. OF RATIONAL EXPRE.
EAITEM36	6. INEQUALITIES	56. ONE UNKNOWN WITH NUM. COEFFI.
EAITEM37	5. ALGEBRAIC EQU.	49. TWO UNKNOWN BY SUBSTITUTION
EAITEM38	3. EXPONENTS	20. POWERS OF 10 & SCIENTIFIC NOTAT.
EAITEM39	5. ALGEBRAIC EQU.	53. SOLVING QUAD.EQUAT.BY FACTORING
EAITEM40	7. RATIONAL EXPO.	61. ADD. & SUB. OF RATIONAL EXPRE.
EAITEM41	9. GEOMETRY	70. VOL. OF CUBES, CYLINDERS,RECTAN.
EAITEM42	9. GEOMETRY	74. APPLIC. , SIMPLE TRIANGLES
EAITEM43	1. INTEGERS	3. FINDING DISTANCES ON NUMBER LINE
EAITEM44	5. ALGEBRAIC EQU.	46. ONE UNKNOWN WITH LIT. COEFFI.
EAITEM45	2. FRACTIONS	17. COMPUTATION OF PROPORTIONS
EAITEM46	9. GEOMETRY	69. CIRCUMFERENCE & AREA OF CIRCLE
EAITEM47	5. ALGEBRAIC EQU.	53. SOLVING QUAD.EQUAT.BY FACTORING
EAITEM48	5. ALGEBRAIC EQU.	45. ONE UNKNOWN WITH NUM. COEFFI.
EAITEM49	5. ALGEBRAIC EQU.	45. ONE UNKNOWN WITH NUM. COEFFI.
EAITEM50	5. ALGEBRAIC EQU.	54. SOLV. QUAD. EQUA. BY QUADRATIC

May 10, 1989

Topic Classification of Test Items

SIMS Benchmark Test

TEST ITEM	TOPIC	SUBTOPIC
COREA006	1. INTEGERS	1. BASIC OPERATIONS WITH SIGNED NO.
COREA019	5. ALGEBRAIC EQU.	51. GENERATING EQUATIONS FROM DESCR.
A101A122	9. GEOMETRY	71. FINDING SUM OF INTERIOR ANGLES
A102A167	9. GEOMETRY	65. GRAPH READING
A104A011	3. EXPONENTS	23. SIMPLIFICATION OF SQ. ROOTS
A105A014		NO CORRESPONDING QUESTIONNAIRE ITEM
A107A028	9. GEOMETRY	66. LOCATI. OF POINTS IN CORD. PLANE
A108A078		NO CORRESPONDING QUESTIONNAIRE ITEM
A109A161	9. GEOMETRY	65. GRAPH READING
A203A138	1. INTEGERS	1. BASIC OPERATIONS WITH SIGNED NO.
A204A071	9. GEOMETRY	68. PERIMETER & AREA OF TRIANGLES,SQ
A205A155		NO CORRESPONDING QUESTIONNAIRE ITEM
A206A126	9. GEOMETRY	66. LOCATI. OF POINTS IN CORD. PLANE
A207A113	1. INTEGERS	1. BASIC OPERATIONS WITH SIGNED NO.
A208A016	5. ALGEBRAIC EQU.	54. SOLV. QUAD. EQUA. BY QUADRATIC
A209A043	1. INTEGERS	3. FINDING DISTANCES ON NUMBER LINE
A301A115	4. POLYNOMIALS	36. EVALUATION OF A POLYNOMIAL(1/2)
A302A088	4. POLYNOMIALS	33. ALGE OPERATION OF LITERAL SYMBOL
A304A067	8. PROB. & STATS.	64. DESCRIPTIVE STATISTICS
A305A145	3. EXPONENTS	32. ESTIM. & APPROXI. WITH RADICALS.
A306A026	9. GEOMETRY	74. APPLIC. , SIMPLE TRIANGLES
A307A009	2. FRACTIONS	15. COMPUTATION OF PERCENT
A308A197	9. GEOMETRY	74. APPLIC. , SIMPLE TRIANGLES
A310A103	9. GEOMETRY	68. PERIMETER & AREA OF TRIANGLES,SQ
A401A110	2. FRACTIONS	15. COMPUTATION OF PERCENT
A402A156	9. GEOMETRY	74. APPLIC. , SIMPLE TRIANGLES
A403A142	2. FRACTIONS	17. COMPUTATION OF PROPORTIONS
A405A037	9. GEOMETRY	68. PERIMETER & AREA OF TRIANGLES,SQ
A406A013	1. INTEGERS	1. BASIC OPERATIONS WITH SIGNED NO.
A407A079	2. FRACTIONS	18. APPLIC. OF RATIO OR PROPORTIONS
A408A144	5. ALGEBRAIC EQU.	51. GENERATING EQUATIONS FROM DESCR.
A409A118	6. INEQUALITIES	56. ONE UNKNOWN WITH NUM. COEFFI.
A501A002		NO CORRESPONDING QUESTIONNAIRE ITEM
A503A185	2. FRACTIONS	5. ADD. & SUB. OF FRACTIONS
A504A053	4. POLYNOMIALS	36. EVALUATION OF A POLYNOMIAL(1/2)
A505A127	9. GEOMETRY	73. APPLIC. , CONGRUENT TRIANGLES
A506A072	9. GEOMETRY	70. VOL. OF CUBES, CYLINDERS,RECTAN.
A508A104	9. GEOMETRY	70. VOL. OF CUBES, CYLINDERS,RECTAN.
A509A151	5. ALGEBRAIC EQU.	45. ONE UNKNOWN WITH NUM. COEFFI.
A601A044	2. FRACTIONS	5. ADD. & SUB. OF FRACTIONS
A602A087	5. ALGEBRAIC EQU.	51. GENERATING EQUATIONS FROM DESCR.
A603A038		NO CORRESPONDING QUESTIONNAIRE ITEM
A604A031		NO CORRESPONDING QUESTIONNAIRE ITEM
A607A191	2. FRACTIONS	15. COMPUTATION OF PERCENT
A608A100		NO CORRESPONDING QUESTIONNAIRE ITEM
A609A057	9. GEOMETRY	72. ISOSCELES & EQUILATERAL TRIANGLE