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ABSTRACT
                The basic rationale for incorporating information
about instructional experiences in the design and analysis of
assessment data is that student ability, topic exposure, and forms of
instructional exposure each contribute to student performance as
measured at a given point in time. The purpose of this study is to
investigate the degree of consistency of teachers' content coverage
reports with logical expectations about the contents of a course with
a given title for two consecutive years and to detect the effects of
content coverage by comparing student performance patterns associated
with teachers' reports of content coverage for 1988 and 1989. In this
study, analyses were based on teacher and student data from
approximately 300 sections of mathematics courses in Pre-Algebra,
Math A, Math B, Algebra I, and Geometry. Across the 5 courses and 12
topics in general, the patterns of responses are consistent with what
might be the expected curriculum patterns in mathematics courses at
each level. Topic coverage is reported for each of the courses. The
pattern of performance on items from the Mathematics Diagnostic
Testing Program tests are reported according to topic and specific
teachers' reports of content coverage. Twelve references are listed.
(YP)

Patterns in Teacher Reports of Topic Coverage and Their Effects on Math Achievement: Comparisons Across Years

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INTRODUCTION

The conceptual and technical design of large-scale assessments which can better capture educational effects has received considerable attention in recent years (e.g., Baker & Herman, 1986; Burstein, 1989; Burstein et al., 1986; Cole, 1988; Linn, 1987, 1989; Muthén, 1989; Muthén, et al., 1988). The basic rational for incorporating information about instructional experiences in the design and analysis of assessment data is that student ability, topic exposure, and forms of instructional exposure each contribute to student performance as measured at a given point in time.

As we have discussed in earlier reports, collecting information about content coverage as part of large-scale assessments can be valued on several grounds. First, many studies (e.g., Berliner, 1980; Burstein et al. (in press); Leinhardt & Seewald, 1981; Leinhardt, 1983; Schmidt, 1983) show that various forms of measuring content coverage are invaluable in accounting for student performance. Second, measures of instructional coverage have served as a means of evaluating the match between the content of tests and the subject matter experiences that students have had (e.g., Leinhardt & Seewald, 1981). Such measures also are useful in examining the sensitivity of test items to differences in instructional experiences of individual students and groups of students.

The purpose of this study is to investigate the degree of consistency of teachers' content coverage reports with logical expectations about the contents of a course with a given title and student composition for two consecutive years and to detect the effects of content coverage by comparing student performance patterns associated with teachers' reports of content coverage for 1988 and 1989 data collected in the context of an ongoing examination of instructional assessment in secondary school mathematics. The results of the data analysis for 1988 was reported earlier (Burstein, Chen & Kim, 1988). This study followed the same procedures using 1989 data, and compared the results across two years. We consider the validity of certain means of gathering information about students' instructional experiences and view student test performance as corroborating evidence. Evidence that reported content coverage pattern are similar across years may suggest that the chosen means of collecting such data has functioned as expected under the "steady state" curricular conditions prevalent in participating schools. Any deviations in reporting patterns across years should be dictated either by (a) the performance of a teachers' students the previous year or (b) differences in class composition across years.

DATA

The data were collected from teachers who volunteered to participate in the Mathematics Diagnostic Testing Program (MDTP). Under this project, the University of California and California State University systems have developed a series of four diagnostic tests (Algebra Readiness, Elementary Algebra, Intermediate Algebra, and Precalculus) to be used voluntarily in secondary and middle schools in California in an effort to improve mathematics education. In this study, analyses are based on teacher and student data from approximately 300 sections (176 sections 3 districts, 8 schools in 1988 and 112 sections 3 districts, 10 schools in 1989) of mathematics spanning courses in Pre Algebra, Math A, Math B, Algebra I, and Geometry. To compare p-values across 1988 and 1989, the Algebra Readiness and Elementary Algebra (1987 form of Elementary Algebra for 1989 data) tests developed by MDTP were used.

INSTRUMENTATION

In our instrumentation, teachers are presented with different math topics and are asked to indicate how these topics are covered in each mathematics course they teach, using the following set of response options:

a. NEW -- Taught as new content
b. EXTENDED -- Reviewed and 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.

These seven response alternatives are adapted from Opportunity to Learn questions and topic specific teacher questionnaires used in the Second International Mathematics Study.[1]

The questionnaire included topics which were identified as included in any of the four tests developed by MDTP or in the secondary school mathematics grid developed as part of an earlier study of the content validity of MDTP tests (Burstein, Aschbacher, Chen, Lin, & Sen, 1986). Thus the questionnaire was expected to span to the course material for college-preparatory secondary school mathematics, necessitating an extensive list of topics (97 topics classified into 12 distinct subgroups): integers (4 topics); fractions, decimal, ratio, proportion, and percent (14); exponents, radicals, and square roots(14); polynomials (12); algebraic equations (11); inequalities (3); rational expressions (4); probability and statistics (2); geometry (15); absolute value (2); functions (10); and trigonometry (6).

METHODS FOR ANALYZING PATTERNS OF TOPIC COVERAGE

There is no clear operational standard for examining the degree of consistency between teachers' content coverage and the effects of content coverage. In this study as in Burstein, Chen, & Kim.(1988), patterns of responses was examined which should align with logical expectations about the contents of a course with a given title and student composition across two years. And also p-values matched with teachers' responses on content coverage were computed.

The first sets of analyses with the teacher data involved the percentage of teacher responses regarding their topic coverage. We examine the responses within and between courses in the 12 broader topic categories. These patterns should be consistent with logical expectation for the topic within a given course, and when a topic clearly aligns with a given course, virtually all teachers claiming to teach that course should be stating that the topic is taught as New(A) or perhaps Extended (B). Percentage of responses (topic by type of coverage) were tabulated for course sections assigned to six categories (Lower than Pre-Algebra, Math A, Math B, Pre-Algebra, Algebra I, Geometry) for 1988 and 1989 in Table 1 (Attachment 1). Note that in addition to percentage tabulations of actual responses, certain combinations of

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[1]This data is a national sample of United States 8th grade students mathematics achievement tests conducted by IEA (the International Association for the Evaluation of Educational achievement) in 1981-1982.

responses (e.g., Taught (A+B+C), Taught + Extended (A+B), Extended + Review (B+C), Review + Assumed (C+D), Not Taught and Not Assumed (E+F+G+Missing) were also tabulated. As shown in Table 1, these percentage data describe the characteristics of both the apparent topical emphases in given courses and whether these emphases are different across sections of the course.

The second sets of analyses report on an attempt to identify which topics are 'Core' for a given course. We proceeded with a strategy to identify from the 1988 and 1989 empirical data those topics that were taught almost uniformly within a course type (operationally 80% of teachers classified as Taught as New (response A) or Extended (B)); such topics assumed to be 'Core' topics. Similarly topics were classified as Prior (C+D), and Not taught (E+F+G) under 80% of teachers' responses were in the indicated category. Topics not falling in any of these categories are also identified. For example, if more than 80% of teachers in Lower than Pre-Algebra classes responded that they taught a topic as New and Extended (A+B), then it was marked as 'C (Core)'. The results are reported in Table 2 (Attachment 2).

The third set of analyses relates the teacher topic coverage response data and its relationship to student performance. The descriptive results of what teachers claimed to teach at various levels are interesting in and of themselves, but the validity of such data might be questioned. Therefore, we decided to ascertain whether the specific response choices corresponded in a systematic way with performance on MDTP and SIMS Benchmark[2] test items measuring a given subtopic. The three tests administered to students in the course types were considered here. Those are the MDTP Algebra Readiness and Elementary Algebra tests and the six short forms of the A level of the SIMS Benchmark tests. Depending on the course in which students are enrolled, they will have taken either the MDTP Algebra Readiness (Lower than Pre Algebra, Math A, Math B, Pre Algebra) or Elementary Algebra (Algebra I and Geometry) tests and one of the six randomly assigned forms of the SIMS Benchmark test. Performance on test items in a given topic area should be consistent with teachers' report of coverage of these topics. The Table 3 (Attachment 3) shows the results of these analyses.

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[2] SIMS Benchmark tests contained 46 items selected from the SIMS pool administered at grade 8. These items were assigned to one of the six forms with two items common across all forms and the remainder allocated to forms to achieve a rough balance in content and difficulty using SIMS performance levels as a guide regarding the latter.

RESULTS

Across courses and topics in general, the patterns of responses are consistent with what might be the expected curriculum patterns in mathematics courses at this level across 1988 and 1989. In <u>Lower than Pre Algebra</u>, nothing is assumed to have been taught before and the vast majority of the topics are judged to be taught later or are not in the curriculum in both 1988 and 1989. Only operations with common and decimal fractions and ratio, proportion, and percent problems were taught as 'Core' by more than 80% of teachers in both years.

In <u>Math A and Math B</u>, almost nothing is assumed to have been taught before, but the subtopics taught in Lower than Pre Algebra were reviewed. And more than 80% of teachers taught as 'Core' the topics taught as 'Core' in Lower than Pre Algebra plus the subtopics such as exponents, powers, perfect squares, addition & subtraction of square roots in 1988 while more than 80% of teachers taught those topics as 'Prior' and 'Core' in 1989. Teachers were more likely to teach higher level subtopics, such as linear equations, Pythagorean Theorem as 'Core' in 1989 compared to 1988. Teachers' responses on these topics differ mainly because these courses are newly created courses in California and are under development.

In <u>Pre Algebra</u> almost all teachers taught or extended the topics within our subcategories integers, fractions/ratio/proportion/percent, and exponents, but otherwise there is much diversity in both years. Some teachers apparently treat Pre Algebra as beginning Algebra with light introductions to Algebra topics, while others consider it the final opportunity to make sure all arithmetic topics are well understood.

Topic coverage in <u>Algebra I</u> concentrates on the traditional core of introductory algebra (exponents, polynomials, algebraic equations, inequalities, rational expressions, absolute value). More than 80% of teachers responded that these topics were taught as 'Core' in both years. Topics that differentiate among subsets of Algebra I sections reflect time devoted to extending and reviewing common and decimal fractions versus those involving enriched preparation for future courses (e.g., geometry topics, function concepts).

In <u>Geometry</u>, there was essentially a universal core of topics with any differentiation associated with whether higher level arithmetic topics are reviewed or assumed, whether the Algebra core is reviewed, or whether special Geometry/Trigonometry topics (e.g., Transformations, Vectors) are introduced. More than 80% of teachers taught all subtopics in Geometry as 'Core' while

transformations and vectors were taught as 'Core' only by 36%(1988) and 45%(1989) of the teachers. The results above showed that the prevalence and type of coverage of topics were consistent with their typical position within the curriculum across both years.

The pattern of performance on items from the MDTP tests classified according to topic and specific teachers' reports of content coverage agree with expectations, but are somewhat uneven. Item p-values were highest when a topic was claimed to have been taught as 'Assumed as Prerequisite' in Algebra Readiness of 1989 and SIMS Benchmark both years, while p-values for that category on Algebra Readiness in 1988 were quite low. This apparent difference is exceptional; very few teachers (typically no more than 1 or 2) chose 'Assumed as Prerequisite' for any one item on these tests so the p-values are not very stable for this response alternative on this test. For both Algebra Readiness and SIMS Benchmark, p-values were highest when topics were indicated as 'Taught as New' with 'Assumed as Prerequisite' taken out of consideration. P-values were lowest when topics were indicated as 'Not in Curriculum', 'Don't Know' and 'No Response' in MDTP Algebra Readiness both years. For the SIMS Benchmark items, the simple rank ordering of average p-values appears confusing because of high p-values for Taught Later, Not in Curriculum, and Don't know for both years. But only one or two teachers chose Not in Curriculum responses for 19 of the 23 items in 1988 and two teachers chose Not in Curriculum responses for 23 out of the 27 items in 1989 falling in this response category. Because of the limited number of respondents, therefore, inference from these data are hazardous. Otherwise, the patterns of performance are associated with response alternatives as expected. Further, even though the patterns of performance in the SIMS Benchmark did not show clear patterns of performance associated with responses, when there is sufficient data to warrant some confidence in performance data, the patterns of performance associated with given response options are roughly as expected.

IMPLICATIONS

Our results showed that a questionnaire approach to soliciting data on types of topic coverage seems to give plausible information about content emphases in instruction. The merits of using teachers' reports of content coverage lie in their feasibility and efficiency. Completion of our instrument required 30 minutes or

less. However, some patterns in the results were aberant, raising questions about the sensitivity of the measure in its current form and about how much confidence can be placed in seemingly simple assessments of content coverage of the type considered here. Further research is needed to refine the approach and its validation methodology of particular interest are questions of what constitutes a reasonably sound relationship between teacher reports and student performance. Whether expected relationships are similar across different types of classes is another issue for exploration.

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Attachment 1

TABLE 1

MDTP 88/89 – TEACHER QUESTIONNAIRE – TOPIC COVERAGE
TOPIC BY TOPIC (12 CATEGORIES), PERCENTAGE

COURSE	TOPIC		NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	B+C	A+B	C+D	E+F+G+M
LOWER THAN PRE-ALGEBRA	1. INTEGERS	'88	.297	.355	.058	.012	.250	.006	.006	.017	.709	.413	.651	.070	.279
		'89	.625	.167	.067	0.00	.050	.067	0.00	.025	.858	.233	.792	.067	.142
	2. FRACTIONS	'88	.417	.432	.088	0.00	.047	0.00	.013	.003	.937	.520	.849	.088	.063
		'89	.474	.238	.286	0.00	0.00	.002	0.00	0.00	.998	.524	.712	.286	.002
	3. EXPONENTS	'88	.150	.081	.015	0.00	.475	.173	.025	.081	.246	.096	.231	.015	.754
		'89	.238	.014	.021	0.00	.469	.252	0.00	.005	.274	.036	.252	.021	.726
	4. POLYNOMIALS	'88	.076	.033	0.00	0.00	.519	.256	0.00	.116	.109	.033	.109	0.00	.891
		'89	.014	0.00	0.00	0.00	.631	.356	0.00	0.00	.014	0.00	.014	0.00	.986
	5. ALGEBRAIC EQU.	'88	.116	0.00	0.00	0.00	.493	.241	0.00	.150	.116	0.00	.116	0.00	.884
		'89	.061	0.01	0.00	0.00	.585	.342	0.00	0.00	.073	.012	.073	0.00	.927
	6. INEQUALITIES	'88	0.000	0.00	0.00	0.00	.535	.256	0.00	.209	0.00	0.00	0.00	0.00	1.00
		'89	0.000	0.00	0.00	0.00	.633	.367	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	7. RATIONAL EXPO.	'88	.076	0.00	0.00	0.00	.483	.233	0.00	.209	.076	0.00	.076	0.00	.924
		'89	.008	.017	0.00	0.00	.625	.350	0.00	0.00	.025	.017	.025	0.00	.975
	8. PROB. & STATS.	'88	.198	0.00	0.00	0.00	.372	.163	.058	.209	.198	0.00	.198	0.00	.802
		'89	.400	.033	0.00	0.00	.100	.267	.033	.167	.433	.033	.433	0.00	.567
	9. GEOMETRY	'88	.211	.028	.037	0.00	.395	.110	.009	.209	.276	.065	.239	.037	.724
		'89	.242	.102	0.00	0.00	.356	.300	0.00	0.00	.344	.102	.344	0.00	.656
	10. ABSOLUTE	'88	0.00	0.00	.070	0.00	.419	.256	.047	.209	.070	.070	0.00	.070	.930
		'89	.183	0.00	0.00	0.00	.467	.350	0.00	0.00	.183	0.00	.183	0.00	.817
	11. FUNCTIONS	'88	0.00	0.00	0.00	0.00	.256	.488	.047	.209	0.00	0.00	0.00	0.00	1.00
		'89	0.00	0.00	0.00	0.00	.633	.367	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	12. TRIGONOMETRY	'88	0.00	0.00	0.00	0.00	.326	.465	0.00	.209	0.00	0.00	0.00	0.00	1.00
		'89	0.00	0.00	0.00	0.00	.467	.533	0.00	0.00	0.00	0.00	0.00	0.00	1.00
COURSE MEAN		'88	.156	.097	.024	.000	.366	.206	.014	.135	.278	.122	.253	.025	.722
		'89	.187	.062	.047	0.00	.420	.278	.001	.005	.296	.109	.249	.047	.704

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MDTP 88/89 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
TOPIC BY TOPIC (12 CATEGORIES), PERCENTAGE

COURSE	TOPIC		NEW	EXTE NDED	REVI EWED	ASSU MED	TAUG HT L ATER	NOT IN C URRI	NOT KNOW	MISS ING	A+B +C	B+C	A+B	C+D	E +F+G +M
			A	B	C	D	E	F	G	M					
MATH A	1. INTEGERS	'88	.800	.100	.100	0.00	0.00	0.00	0.00	0.00	1.00	.200	.900	.100	0.00
		'89	.833	0.00	0.00	.167	0.00	0.00	0.00	0.00	.833	0.00	.833	.167	0.00
	2. FRACTIONS	'88	.581	.100	.233	0.00	.071	.014	0.00	0.00	.914	.333	.681	.233	.086
		'89	.143	0.00	.857	0.00	0.00	0.00	0.00	0.00	1.00	.857	.143	.857	0.00
	3. EXPONENTS	'88	.186	.057	0.00	.071	.400	0.00	.057	.229	.243	.057	.243	.071	.686
		'89	.548	0.00	0.00	0.00	.190	.262	0.00	0.00	.548	0.00	.548	0.00	.452
	4. POLYNOMIALS	'88	.267	0.00	0.00	0.00	.317	0.00	.017	.400	.267	0.00	.267	0.00	.733
		'89	.556	0.00	0.00	0.00	.056	.333	0.00	.056	.556	0.00	.556	0.00	.444
	5. ALGEBRAIC EQU.	'88	.164	0.00	0.00	0.00	.436	0.00	0.00	.400	.164	0.00	.164	0.00	.836
		'89	.303	.121	0.00	0.00	.364	.212	0.00	0.00	.424	.121	.424	0.00	.576
	6. INEQUALITIES	'88	.267	0.00	0.00	0.00	.333	0.00	0.00	.400	.267	0.00	.267	0.00	.733
		'89	.667	0.00	0.00	0.00	0.00	.333	0.00	0.00	.667	0.00	.667	0.00	.333
	7. RATIONAL EXPO.	'88	.300	0.00	0.00	0.00	.300	0.00	0.00	.400	.300	0.00	.300	0.00	.700
		'89	.667	.167	0.00	0.00	0.00	.167	0.00	0.00	.833	.167	.833	0.00	.167
	8. PROB. & STATS.	'88	.300	0.00	0.00	0.00	.300	0.00	0.00	.400	.300	0.00	.300	0.00	.700
		'89	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00
	9. GEOMETRY	'88	.080	.040	0.00	0.00	.467	0.00	.013	.400	.120	.040	.120	0.00	.880
		'89	.444	.133	0.00	0.00	.178	.244	0.00	0.00	.578	.133	.578	0.00	.422
	10. ABSOLUTE	'88	.100	0.00	0.00	0.00	.500	0.00	0.00	.400	.100	0.00	.100	0.00	.900
		'89	.667	0.00	0.00	0.00	0.00	.333	0.00	0.00	.667	0.00	.667	0.00	.333
	11. FUNCTIONS	'88	.100	0.00	0.00	0.00	.460	0.00	.040	.400	.100	0.00	.100	0.00	.900
		'89	.133	0.00	0.00	0.00	.533	.333	0.00	0.00	.133	0.00	.133	0.00	.867
	12. TRIGONOMETRY	'88	0.00	0.00	0.00	0.00	.600	0.00	0.00	.400	0.00	0.00	0.00	0.00	1.00
		'89	.111	0.00	0.00	0.00	.556	.333	0.00	0.00	.111	0.00	.111	0.00	.889
COURSE MEAN		'88	.247	.033	.038	.010	.353	.002	.016	.301	.318	.071	.280	.048	.672
		'89	.409	.041	.124	.007	.192	.220	0.00	.007	.574	.165	.450	.131	.419

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COURSE	TOPIC		NEW	EXTE NDED	REVI EWED	ASSU MED	TAUG HT L ATER	NOT IN C URRI	NOT KNOW	MISS ING	A+B +C	B+C	A+B	C+D	E +F+G
			A	B	C	D	E	F	G	M					
MATH B	1. INTEGERS	'88	0.00	.850	.150	0.00	0.00	0.00	0.00	0.00	1.00	1.00	.850	.150	0.00
		'89	.417	.333	0.00	.250	0.00	0.00	0.00	0.00	.750	.333	.750	.250	0.00
	2. FRACTIONS	'88	0.00	.771	0.00	0.00	0.00	0.00	0.00	.229	.771	.771	.771	0.00	.229
		'89	.071	0.00	.929	0.00	0.00	0.00	0.00	0.00	1.00	.929	.071	.929	0.00
	3. EXPONENTS	'88	.414	0.00	0.00	0.00	.014	.400	0.00	.171	.414	0.00	.414	0.00	.586
		'89	.452	0.00	.024	0.00	.262	.262	0.00	0.00	.476	.024	.452	.024	.524
	4. POLYNOMIALS	'88	.183	0.00	0.00	0.00	.017	.800	0.00	0.00	.183	0.00	.183	0.00	.817
		'89	.333	0.00	0.00	.306	0.00	.333	0.00	.028	.333	0.00	.333	.306	.361
	5. ALGEBRAIC EQU.	'88	.145	0.00	0.00	0.00	.055	.800	0.00	0.00	.145	0.00	.145	0.00	.855
		'89	.182	.212	.061	.061	.273	.212	0.00	0.00	.455	.273	.394	.121	.485
	6. INEQUALITIES	'88	.200	0.00	0.00	0.00	0.00	.800	0.00	0.00	.200	0.00	.200	0.00	.800
		'89	.111	.222	0.00	0.00	.333	.333	0.00	0.00	.333	.222	.333	0.00	.667
	7. RATIONAL EXPO.	'88	.150	0.00	0.00	0.00	.050	.800	0.00	0.00	.150	0.00	.150	0.00	.850
		'89	.167	.500	0.00	0.00	.167	.167	0.00	0.00	.667	.500	.667	0.00	.333
	8. PROB. & STATS.	'88	.800	0.00	0.00	0.00	.200	0.00	0.00	0.00	.800	0.00	.800	0.00	.200
		'89	.667	.333	0.00	0.00	0.00	0.00	0.00	0.00	1.00	.333	1.00	0.00	0.00
	9. GEOMETRY	'88	0.00	.160	0.00	0.00	.200	.640	0.00	0.00	.160	.160	.160	0.00	.840
		'89	.200	.333	0.00	0.00	.222	.244	0.00	0.00	.533	.333	.533	0.00	.467
	10. ABSOLUTE	'88	0.00	0.00	0.00	0.00	.200	.800	0.00	0.00	0.00	0.00	0.00	0.00	1.00
		'89	.167	.500	0.00	0.00	0.00	.333	0.00	0.00	.667	.500	.667	0.00	.333
	11. FUNCTIONS	'88	0.00	0.00	0.00	0.00	.200	.800	0.00	0.00	0.00	0.00	0.00	0.00	1.00
		'89	.033	.167	0.00	0.00	.467	.333	0.00	0.00	.200	.167	.200	0.00	.800
	12. TRIGONOMETRY	'88	0.00	0.00	0.00	0.00	.200	.800	0.00	0.00	0.00	0.00	0.00	0.00	1.00
		'89	.056	0.00	0.00	0.00	.611	.333	0.00	0.00	.056	0.00	.056	0.00	.944
COURSE MEAN		'88	.128	.171	.006	0.00	.085	.553	0.00	.058	.305	.177	.299	.006	.695
		'89	.220	.151	.144	.055	.206	.220	0.00	.003	.515	.296	.371	.199	.430

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MDTP88/89- TEACHER QUESTIONNAIRE - TOPIC COVERAGE
TOPIC BY TOPIC (12 CATEGORIES), PERCENTAGE

COURSE	TOPIC		NEW	EXTENDED	REVIEWED	ASSUMED	TAUGHT LATER	NOT IN CURRI	NOT KNOW	MISSING	A+B+C	B+C	A+B	C+D	F+F+G+M
			A	B	C	D	E	F	G	M					
PRE-ALGEBRA	1. INTEGERS	'89	.468	.378	.135	0.00	.013	.006	0.00	0.00	.981	.513	.846	.135	.019
		'89	.673	.096	.154	.077	0.00	0.00	0.00	0.00	.923	.250	.769	.231	0.00
	2. FRACTIONS	'88	.185	.440	.370	.004	.002	0.00	0.00	0.00	.995	.810	.625	.374	.002
		'89	.445	.247	.247	.060	0.00	0.00	0.00	0.00	.940	.495	.692	.308	0.00
	3. EXPONENTS	'88	.480	.064	.013	0.00	.332	.112	0.00	0.00	.557	.077	.544	.013	.443
		'89	.330	.027	.077	.016	.220	.209	0.00	.121	.434	.104	.357	.093	.549
	4. POLYNOMIALS	'88	.218	.004	0.00	0.00	.630	.130	0.00	.017	.222	.004	.222	0.00	.778
		'89	.167	.006	.026	.045	.397	.205	0.00	.154	.199	.032	.173	.071	.756
	5. ALGEBRAIC EQU	'88	.235	.023	0.00	0.00	.594	.124	.014	.009	.259	.023	.259	0.00	.741
		'89	.357	.014	.049	.014	.210	.203	0.00	.154	.420	.063	.371	.063	.566
	6. INEQUALITIES	'88	.316	0.00	0.00	0.00	.590	.094	0.00	0.00	.316	0.00	.316	0.00	.684
		'89	.410	0.00	.026	0.00	.205	.205	0.00	.154	.436	.026	.410	.026	.564
	7. RATIONAL EXPO	'88	.500	0.00	0.00	0.00	.340	.141	.019	0.00	.500	0.00	.500	0.00	.500
		'89	.462	0.00	0.00	.077	.154	.154	0.00	.154	.462	0.00	.462	.077	.462
	8. PROB. & STATS	'88	.077	.359	0.00	0.00	.231	.179	.154	0.00	.436	.359	.436	0.00	.564
		'89	.038	.115	0.00	0.00	.385	.308	0.00	.154	.154	.115	.154	0.00	.846
	9. GEOMETRY	'88	.253	.173	.140	0.00	.294	.126	.014	0.00	.566	.313	.426	.140	.434
		'89	.462	.067	.010	0.00	.154	.149	.005	.154	.538	.077	.528	.010	.462
	10. ABSOLUTE	'88	.603	0.00	0.00	0.00	.321	.077	0.00	0.00	.603	0.00	.603	0.00	.397
		'89	.385	0.00	.077	0.00	.231	.154	0.00	.154	.462	.077	.385	.077	.538
	11. FUNCTIONS	'88	.026	0.00	0.00	0.00	.615	.313	.046	0.00	.026	0.00	.026	0.00	.974
		'89	0.00	0.00	0.00	0.00	.462	.385	0.00	.154	0.00	0.00	0.00	0.00	1.00
	12. TRIGONOMETRY	'88	.103	0.00	0.00	0.00	.503	.295	0.00	0.00	.103	0.00	.103	0.00	.897
		'89	.038	0.00	0.00	0.00	.462	.346	0.00	.154	.038	0.00	.038	0.00	.962
COURSE MEAN		'88	.261	.126	.082	.001	.384	.131	.012	.003	.469	.208	.387	.083	.530
		'89	.315	.059	.066	.025	.230	.185	.001	.121	.439	.125	.374	.090	.536

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MDTP88/89 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
TOPIC BY TOPIC (12 CATEGORIES), PERCENTAGE

COURSE	TOPIC		NEW	EXTE NDED	REVI EWED	ASSU MED	TAUG HT L ATER	NOT IN C URRI	NOT KNOW	MISS ING	A+B +C	B+C	A+B	C+D	E +F+G +M
			A	B	C	D	E	F	G	M					
ALGEBRA 1,2 (OR ALGEBRA I)	1. INTEGERS	'88	.352	.328	.141	.141	0.00	0.00	0.00	.039	.820	.469	.680	.281	.039
		'89	.420	.150	.290	.140	0.00	0.00	0.00	0.00	.860	.440	.570	.430	0.00
	2. FRACTIONS	'88	.105	.435	.185	.275	0.00	0.00	0.00	0.00	.725	.621	.540	.460	0.00
		'89	.117	.389	.380	.097	0.00	.006	0.00	.011	.886	.769	.506	.477	.017
	3. EXPONENTS	'88	.743	.085	.020	.004	.141	0.00	0.00	.007	.848	.105	.828	.025	.147
		'89	.594	.123	.051	.023	.114	0.00	.014	.080	.769	.174	.717	.074	.209
	4. POLYNOMIALS	'88	.844	.112	0.00	0.00	.044	0.00	0.00	0.00	.956	.112	.956	0.00	.044
		'89	.890	.053	0.00	.047	.010	0.00	0.00	0.00	.943	.053	.943	.047	.010
	5. ALGEBRAIC EQU	'88	.838	.080	0.00	0.00	.077	0.00	0.00	.006	.918	.080	.918	0.00	.082
		'89	.789	.084	0.00	.040	.087	0.00	0.00	0.00	.873	.084	.873	.040	.087
	6. INEQUALITIES	'88	.833	.083	0.00	0.00	.083	0.00	0.00	0.00	.917	.083	.917	0.00	.083
		'89	.720	0.00	0.00	.040	.187	0.00	0.00	.053	.720	0.00	.720	.040	.240
	7. RATIONAL EXPO	'88	.844	.094	0.00	0.00	.062	0.00	0.00	0.00	.937	.094	.937	0.00	.062
		'89	.960	0.00	0.00	.040	0.00	0.00	0.00	0.00	.960	0.00	.960	.040	0.00
	8. PROB. & STATS	'88	.187	.109	0.00	0.00	.656	0.00	.047	0.00	.297	.109	.297	0.00	.703
		'89	.080	.120	0.00	0.00	.160	.160	.220	.260	.200	.120	.200	0.00	.800
	9. GEOMETRY	'88	.217	.098	.027	.085	.552	.012	.008	0.00	.342	.125	.315	.112	.573
		'89	.200	.101	.048	.061	.360	.123	0.00	.107	.349	.149	.301	.109	.589
	10. ABSOLUTE	'88	.859	.047	0.00	0.00	.031	0.00	.062	0.00	.906	.047	.906	0.00	.094
		'89	.840	.040	0.00	.040	0.00	0.00	0.00	.080	.880	.040	.880	.040	.080
	11. FUNCTIONS	'88	.262	0.00	.062	0.00	.650	.025	0.00	0.00	.325	.062	.262	.062	.675
		'89	.192	.016	0.00	0.00	.232	.120	.200	.240	.208	.016	.208	0.00	.792
	12. TRIGONOMETRY	'88	.005	0.00	.062	0.00	.927	.005	0.00	0.00	.068	.062	.005	.062	.932
		'89	.040	0.00	0.00	0.00	.360	.160	.200	.240	.040	0.00	.040	0.00	.960
COURSE MEAN		'88	.479	.136	.050	.059	.264	.005	.004	.003	.666	.186	.616	.109	.275
		'89	.454	.117	.082	.047	.139	.045	.040	.078	.652	.198	.570	.128	.301

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MDTP88/89 - TEACHER QUESTIONNAIRE - TOPIC COVERAGE
TOPIC BY TOPIC (12 CATEGORIES), PERCENTAGE

COURSE	TOPIC		NEW A	EXTENDED B	REVIEWED C	ASSUMED D	TAUGHT LATER E	NOT IN CURRI F	NOT KNOW G	MISSING M	A+B+C	B+C	A+B	C+D	E+F+G+M
GEOMETRY	1. INTEGERS	'88	.023	.170	.239	.568	0.00	0.00	0.00	0.00	.432	.409	.193	.807	0.00
		'89	.167	.238	.214	.381	0.00	0.00	0.00	0.00	.619	.452	.405	.595	0.00
	2. FRACTIONS	'88	.042	.227	.276	.448	.006	0.00	0.00	0.00	.545	.503	.269	.724	.006
		'89	.048	.327	.381	.231	.014	0.00	0.00	0.00	.755	.707	.374	.612	.014
	3. EXPONENTS	'88	.149	.201	.351	.169	.055	.029	.045	0.00	.701	.552	.351	.519	.130
		'89	.160	.245	.259	.116	.150	.054	.017	0.00	.663	.503	.405	.374	.221
	4. POLYNOMIALS	'88	.038	.201	.360	.242	.068	0.00	.091	0.00	.598	.561	.239	.602	.159
		'89	.063	.028	.476	.337	.052	.044	0.00	0.00	.567	.504	.091	.813	.095
	5. ALGEBRAIC EQU	'88	.037	.194	.256	.347	.050	.033	.058	.025	.488	.450	.231	.603	.165
		'89	.052	.199	.346	.190	.074	.052	.087	0.00	.597	.545	.251	.537	.212
	6. INEQUALITIES	'88	0.00	.152	.182	.439	.091	.091	0.00	.045	.333	.333	.152	.621	.227
		'89	.032	0.00	.175	.048	.175	.143	.238	.190	.206	.175	.032	.222	.746
	7. RATIONAL EXPO	'88	0.00	.182	.227	.409	.045	.091	0.00	.045	.409	.409	.182	.636	.182
		'89	.095	0.00	.476	.190	0.00	0.00	.238	0.00	.571	.476	.095	.667	.238
	8. PROB. & STATS	'88	0.00	.091	0.00	0.00	.591	.136	.136	.045	.091	.091	.091	0.00	.909
		'89	0.00	.048	0.00	0.00	.429	.286	.238	0.00	.048	.048	.048	0.00	.952
	9. GEOMETRY	'88	.721	.091	.033	.009	.079	.006	.015	.045	.845	.124	.812	.042	.145
		'89	.638	.140	.013	.010	.092	.092	.016	0.00	.790	.152	.778	.022	.200
	10. ABSOLUTE	'88	.182	.091	.182	.227	.091	.091	.091	.045	.455	.273	.273	.409	.318
		'89	.190	0.00	.357	.048	.310	.095	0.00	0.00	.548	.357	.190	.405	.405
	11. FUNCTIONS	'88	.091	.009	.055	.059	.686	.050	.005	.045	.155	.064	.100	.114	.786
		'89	.086	0.00	.029	.024	.352	.262	.238	0.00	.114	.029	.086	.052	.862
	12. TRIGONOMETRY	'88	.197	0.00	0.00	.045	.689	.023	0.00	.045	.197	0.00	.197	.045	.758
		'89	.143	0.00	0.00	0.00	.381	.238	.238	0.00	.143	0.00	.143	0.00	.857
COURSE MEAN		'88	.174	.147	.203	.227	.167	.027	.032	.022	.524	.350	.321	.431	.248
		'89	.176	.141	.237	.143	.134	.087	.076	.006	.553	.378	.317	.380	.303

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

COURSE	TOPIC		NEW	EXTE NDED	REVI EWED	ASSU MED	TAUG HT L ATER	NOT IN C URRI	NOT KNOW	MISS ING	A+B +C	B+C	A+B	C+D	E +F+G +M
			A	B	C	D	E	F	G	M					
TOTAL		'88	.259	.115	.070	.045	.311	.112	.014	.073	.445	.186	.375	.116	.510
		'89	.284	.094	.107	.048	.241	.160	.027	.039	.485	.201	.378	.155	.467

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Attachment 2

TABLE 2

1988 TEACHER CONTENT COVERAGE BY COURSES - BY SUBTOPIC
(80% Teachers' agreement on each topic)

ITEMS	LOWER THAN PRE ALGEBRA	MATH A	MATH B	PRE ALGEBRA	ALGEBRA 1	GEOMETRY
1 'BASIC OPERATIONS WITH SIGNED NO.'	*	*	*	C(38)	*	P(19)
2 'PRIME FACTORIZATION'	*	C(12)	C(5)	C(38)	C(27)	P(19)
3 'FINDING DISTANCES ON NUMBER LINE'	*	*	*	C(35)	*	*
4 'USING DEFINITION OF DIVISIBILITY'	*	C(15)	*	*	*	*
5 'ADD. & SUB. OF FRACTIONS'	C(36)	*	C(5)	*	*	P(19)
6 'MUL. & DIV. OF FRACTIONS'	C(36)	*	C(5)	*	*	P(19)
7 'ORDER & COMPARISON OF FRACTIONS'	C(36)	*	C(5)	*	*	P(19)
8 'SIMPLIF. OF COMPLEX FRACTIONS'	*	*	C(5)	*	*	*
9 'ADD. & SUB OF DECIMALS'	C(37)	*	C(5)	*	*	P(19)
10 'MUL. & DIV. OF DECIMALS'	C(39)	*	C(5)	*	*	P(19)
11 'ESTIMATION & APPROXIMATION'	C(38)	*	C(5)	*	*	*
12 'CONV. BET. FRACTIONS & DECIMALS '	C(38)	*	C(5)	*	*	P(18)
13 'CONV. BET. FRACTIONS & PERCENT'	C(38)	*	C(5)	*	*	P(18)
14 'COMPUT. WITH DECI & FRAC, ROUND'	C(38)	*	C(5)	*	*	P(18)
15 'COMPUTATION OF PERCENT'	C(38)	*	C(5)	C(32)	*	*
16 'CONCEPT OF PROPORTION'	C(35)	*	C(5)	C(33)	*	*
17 'COMPUTATION OF PROPORTIONS'	C(35)	*	C(5)	C(33)	C(28)	*
18 'APPLIC. CF RATIO OR PROPORTIONS'	C(35)	*	C(5)	C(33)	C(28)	*
19 'APPLIC. LAWS OF EXPONENTS'	*	C(13)	C(5)	*	C(31)	*
20 'POWERS OF 10 & SCIENTIFIC NOTAT.'	*	*	C(5)	C(33)	C(29)	*
21 'EXPONENT. WITH INTEGRAL EXPONEN.'	*	*	C(5)	*	C(29)	*
22 'SQ. ROOT OF PERFECT SQUARES'	*	*	C(5)	*	C(27)	*
23 'SIMPLIFICATION OF SQ. ROOTS'	*	*	C(5)	*	C(26)	*
24 'ADD. & SUB. OF SQ. ROOTS'	*	*	C(5)	*	C(26)	*
25 'MUL. & DIV. OF SQ. ROOTS'	*	*	C(5)	*	C(26)	*
26 'CONV. BET. RADICALS & RAT. EXPO.'	N(34)	N(9)	*	*	*	*
27 'RATIONALIZ. OF NUMERA. & DENOMI.'	N(34)	N(9)	*	*	*	*
28 'ADD. AND SUB. OF RADICAL EXPRE. '	N(34)	N(9)	*	*	*	*
29 'NUM. CALCU. W/ EXPONENTS & RAD. '	N(34)	*	*	*	*	*
30 'ALGE. CALCU. W/ EXPONENTS & RAD.'	N(34)	*	*	*	*	*
31 'FACTORING & SIMPLI. ALGE. EXPRE.'	N(34)	*	N(5)	N(34)	*	*
32 'ESTIM. & APPROXI. WITH RADICALS.'	N(34)	N(9)	*	*	C(27)	*
33 'ALGE OPERATION OF LITERAL SYMBOL'	*	*	*	*	C(32)	*
34 'SIMPLIF. OF POLYNO. BY GROUPING.'	N(34)	*	*	*	C(32)	*
35 'ADD. & SUB. OF POLYNOMIALS'	N(34)	*	*	*	C(32)	*
36 'EVALUATION OF A POLYNOMIAL(1/2) '	N(34)	*	*	*	C(32)	*
37 'MUL. OF MONOMIAL WITH A POLYNO. '	N(34)	*	*	*	C(32)	*
38 'MUL. OF TWO BINOMIALS'	N(34)	*	*	N(33)	C(32)	*
39 'DIVISION OF POLYNOMIALS'	N(34)	*	*	N(36)	C(31)	*
40 'SQUARING A BINOMIAL'	N(34)	*	*	N(36)	C(31)	*
41 'FACTOR. POLYNOMIALS'	N(34)	*	*	N(30)	C(32)	*
42 'FACTOR. TRINOMIAL OVER INTEGERS '	N(34)	*	*	N(34)	C(31)	*
43 'FACTOR. PERFECT SQ. TRINOMIALS '	N(34)	*	*	N(34)	C(31)	*
44 'SIMPLIF. OF COMPLEX NUMBERS'	N(34)	N(9)	N(5)	N(35)	*	*
45 'ONE UNKNOWN WITH NUM. COEFFI.'	*	*	*	*	C(32)	*
46 'ONE UNKNOWN WITH LIT. COEFFI.'	*	*	*	*	C(32)	*

C: Core

P: Prior

N: Not Taught

*: Eclectic: no category received 80% agrement among Teachers

Given in parenthesis is the number of sections when computing more than 80% Teachers' agreement.

1988 TEACHER CONTENT COVERAGE BY COURSES - BY SUBTOPIC
(80% Teachers' agreement on each topic)

ITEMS	LOWER THAN PRE ALGEBRA	MATH A	MATH B	PRE ALGEBRA	ALGEBRA 1	GEOMETRY
47 'SIMPLE LIN. EQUA. IN ONE UNKNOWN'	*	*	*	*	C(32)	*
48 'TWO UNKNOWN BY ELIMINATION'	N(34)	N(9)	*	*	C(31)	*
49 'TWO UNKNOWN BY SUBSTITUTION'	N(34)	N(9)	*	*	C(31)	*
50 'APPLICATION OF EQUATIONS'	N(31)	*	*	*	C(32)	*
51 'GENERATING EQUATIONS FROM DESCR.'	N(31)	*	N(5)	*	C(30)	*
52 'SOLV. EQUA. FROM FACTORED FORM'	N(34)	N(9)	*	N(39)	C(28)	*
53 'SOLVING QUAD.EQUAT.BY FACTORING '	N(34)	N(9)	*	N(39)	C(28)	*
54 'SOLV. QUAD. EQUA. BY QUADRATIC '	N(34)	N(9)	N(5)	N(39)	C(28)	*
55 'GRAPHS OF QUADRATIC RELATIONS'	N(34)	N(9)	N(5)	N(39)	*	*
56 'ONE UNKNOWN WITH NUM. COEFFI.'	N(34)	*	*	*	C(32)	*
57 'SOLUT. OF QUADRATIC INEQUALITIES'	N(34)	N(9)	*	N(34)	*	*
58 'GRAPHING LIN. INEQ. IN ONE UNKNO'	N(34)	*	*	*	C(32)	*
59 'SIMPLIF. OF A RATIONAL EXPRE.'	*	*	*	*	C(30)	*
60 'EVALUATION OF A RATIONAL EXPRE. '	N(32)	*	*	*	C(30)	*
61 'ADD. & SUB. OF RATIONAL EXPRE.'	N(32)	*	*	*	C(30)	*
62 'MUL. & DIV. OF RATIONAL EXPRE.'	N(32)	*	N(5)	*	C(30)	*
63 'PROBABILITY'	*	*	*	*	*	N(19)
64 'DESCRIPTIVE STATISTICS'	*	*	*	*	*	N(19)
65 'GRAPH READING'	*	*	*	*	C(26)	*
66 'LOCATI. OF POINTS IN CORD. PLANE'	*	*	N(5)	*	C(26)	*
67 'DISTANCE BET. TWO POINTS IN COR.'	*	N(9)	N(5)	*	*	*
68 'PERIMETER & AREA OF TRIANGLES,SQ	*	*	*	*	*	C(21)
69 'CIRCUMFERENCE & AREA OF CIRCLE'	*	*	*	*	*	C(21)
70 'VOL. OF CUBES, CYLINDERS,RECTAN.'	*	*	N(5)	*	*	C(21)
71 'FINDING SUM OF INTERIOR ANGLES'	*	N(9)	N(5)	*	N(27)	C(21)
72 'ISOSCELES & EQUILATERAL TRIANGLE'	*	N(9)	N(5)	*	*	C(21)
73 'APPLIC. , CONGRUENT TRIANGLES'	*	N(9)	N(5)	*	*	C(21)
74 'APPLIC. , SIMPLE TRIANGLES'	*	N(9)	N(5)	*	*	C(21)
75 'PYTHAGOREAN THEOREM & SPECI. TR.'	*	N(9)	N(5)	*	*	C(21)
76 'PARALLELISM & PERPENDICULARITY'	*	N(9)	N(5)	*	*	C(21)
77 'PROOFS(FORMAL DEDUCTIVE DEMONST.'	N(31)	N(9)	N(5)	N(39)	N(28)	C(21)
78 'TRANSFORMATIONS(TRANSLATION.'	N(31)	N(9)	N(5)	N(39)	N(30)	*
79 'VECTORS'	N(31)	N(9)	N(5)	N(39)	N(30)	*
80 'SIMPLIF. & EVALU. OF EXPRESS.'	N(31)	*	N(5)	*	C(29)	*
81 'SOLUTION OF EQUATIONS'	N(31)	N(9)	N(5)	*	C(29)	*
82 'FUNCT. CONCEPT & USE OF NOTATION'	N(34)	*	N(5)	N(36)	*	*
83 'FUNCT. EVALUATION USING SUBSTIT.'	N(34)	*	N(5)	N(36)	*	*
84 'COMPOSITION OF FUNCTION'	N(34)	N(9)	N(5)	N(37)	*	*
85 'GRAPHING OF FUNCTION'	N(34)	N(9)	N(5)	N(37)	*	*
86 'NUMERICAL FUNCTIONALEVALUATION'	N(34)	*	N(5)	N(39)	N(27)	N(18)
87 'SUBSTITUTING LITERAL EXPRESS.'	N(34)	N(9)	N(5)	N(39)	*	N(18)
88 'DEFINITION, LAWS & RULES'	N(34)	N(9)	N(5)	N(39)	N(27)	N(18)
89 'INVERSE RELATION BET. LOG. & EXP'	N(34)	N(9)	N(5)	N(39)	N(27)	N(18)
90 'SOLUTION OF LOG. AND EXP. FUNCT.'	N(34)	N(9)	N(5)	N(39)	N(27)	N(18)
91 'GRAPHING OF LOG. AND EXP. FUNCT.'	N(34)	N(9)	N(5)	N(39)	N(27)	N(18)
92 'FIND. ALGEBRAIC EXPRESS'	N(34)	N(9)	N(5)	*	N(30)	*
93 'DESCRIB. VARIATIONS OF FUNCTION '	N(34)	N(9)	N(5)	*	N(30)	N(17)
94 'FIND. SIDE LENGTHS IN SPEC.TRIA.'	N(34)	N(9)	N(5)	N(37)	N(29)	*
95 'GRAPHING TRIGONOMETRIC FUNCTIONS'	N(34)	N(9)	N(5)	N(39)	N(30)	N(18)
96 'REDUCING TRIGONOMETRIC EXPRE.'	N(34)	N(9)	N(5)	N(39)	N(30)	N(18)
97 'PROOF OF TRIGONOMETRIC IDENTITIE'	N(34)	N(9)	N(5)	N(39)	N(30)	N(18)

1989 TEACHER CONTENT COVERAGE BY COURSES - BY SUBTOPIC
(80% Teachers' agreement on each topic)

ITEMS	LOWER THAN PRE ALGEBRA	MATH A	MATH B	PRE ALGEBRA	ALGEBRA 1	GEOMETRY
1 'BASIC OPERATIONS WITH SIGNED NO.'	C(22)	*	*	*	*	P(19)
2 'PRIME FACTORIZATION'	C(22)	C(6)	*	C(12)	*	*
3 'FINDING DISTANCES ON NUMBER LINE'	*	C(6)	*	C(11)	*	C(19)
4 'USING DEFINITION OF DIVISIBILITY'	C(21)	C(6)	C(3)	*	*	*
5 'ADD. & SUB. OF FRACTIONS'	*	P(6)	P(3)	*	*	*
6 'MUL. & DIV. OF FRACTIONS'	*	P(6)	P(3)	*	*	*
7 'ORDER & COMPARISON OF FRACTIONS '	*	P(6)	P(3)	*	*	P(20)
8 'SIMPLIF. OF COMPLEX FRACTIONS'	*	P(6)	P(3)	*	*	*
9 'ADD. & SUB OF DECIMALS'	*	P(6)	P(3)	*	*	*
10 'MUL. & DIV. OF DECIMALS'	*	P(6)	P(3)	*	*	*
11 'ESTIMATION & APPROXIMATION'	C(24)	P(6)	P(3)	*	*	*
12 'CONV. BET. FRACTIONS & DECIMALS '	*	P(6)	P(3)	*	*	*
13 'CONV. BET. FRACTIONS & PERCENT'	*	P(6)	P(3)	*	*	*
14 'COMPUT. WITH DECI & FRAC, ROUND.'	C(24)	P(6)	P(3)	*	*	*
15 'COMPUTATION OF PERCENT'	C(21)	P(6)	P(3)	C(12)	*	*
16 'CONCEPT OF PROPORTION'	C(21)	*	*	C(13)	*	*
17 'COMPUTATION OF PROPORTIONS'	C(21)	*	*	C(12)	*	*
18 'APPLIC. OF RATIO OR PROPORTIONS '	C(21)	*	*	C(12)	*	*
19 'APPLIC. LAWS OF EXPONENTS'	*	C(6)	C(3)	*	C(23)	*
20 'POWERS OF 10 & SCIENTIFIC NOTAT.'	*	C(6)	C(3)	*	*	*
21 'EXPONENT. WITH INTEGRAL EXPONEN.'	*	C(6)	C(3)	*	C(21)	P(17)
22 'SQ. ROOT OF PERFECT SQUARES'	*	*	*	C(10)	*	*
23 'SIMPLIFICATION OF SQ. ROOTS'	*	*	*	*	*	*
24 'ADD. & SUB. OF SQ. ROOTS'	*	*	*	*	C(22)	*
25 'MUL. & DIV. OF SQ. ROOTS'	*	N(6)	*	*	C(22)	*
26 'CONV. BET. RADICALS & RAT. EXPO.'	N(25)	N(6)	N(3)	*	*	*
27 'RATIONALIZ. OF NUMERA. & DENOMI.'	N(25)	*	*	*	C(18)	*
28 'ADD. AND SUB. OF RADICAL EXPRE. '	N(25)	N(6)	N(3)	N(11)	*	*
29 'NUM. CALCU. W/ EXPONENTS & RAD. '	N(25)	*	*	*	C(18)	*
30 'ALGE. CALCU. W/ EXPONENTS & RAD.'	N(25)	N(6)	N(3)	*	*	*
31 'FACTORING & SIMPLI. ALGE. EXPRE.'	N(25)	*	*	*	*	*
32 'ESTIM. & APPROXI. WITH RADICALS.'	N(25)	*	*	*	*	*
33 'ALGE OPERATION OF LITERAL SYMBOL'	N(25)	*	*	C(9)	C(22)	*
34 'SIMPLIF. OF POLYNO. BY GROUPING.'	N(25)	*	*	*	C(24)	P(19)
35 'ADD. & SUB. OF POLYNOMIALS'	N(25)	*	*	*	C(24)	P(19)
36 'EVALUATION OF A POLYNOMIAL(1/2) '	N(25)	*	*	*	C(24)	*
37 'MUL. OF MONOMIAL WITH A POLYNO. '	N(25)	*	*	*	C(24)	P(19)
38 'MUL. OF TWO BINOMIALS'	N(25)	*	*	N(10)	C(24)	P(19)
39 'DIVISION OF POLYNOMIALS'	N(25)	*	*	N(10)	C(24)	*
40 'SQUARING A P?IOMIAL'	N(25)	*	*	N(10)	C(24)	P(19)
41 'FACTOR. POLYNOMIALS'	N(25)	*	*	N(10)	C(24)	P(19)
42 'FACTOR. TRINOMIAL OVER INTEGERS '	N(25)	N(2)	*	N(10)	C(24)	P(19)
43 'FACTOR. PERFECT SQ. TRINOMIALS'	N(25)	*	*	N(10)	C(24)	P(19)
44 'SIMPLIF. OF COMPLEX NUMBERS'	N(25)	N(6)	*	N(10)	C(21)	*
45 'ONE UNKNOWN WITH NUM. COEFFI.'	*	C(6)	*	*	C(24)	*
46 'ONE ... NOWN WITH LIT. COEFFI.'	N(22)	*	*	*	C(24)	*
47 'SIMPLE LIN. EQUA. IN ONE UNKNOWN'	*	C(6)	*	*	C(24)	*
48 'TWO UNKNOWN BY ELIMINATION'	N(25)	N(6)	*	*	C(23)	*
49 'TWO UNKNOWN BY SUBSTITUTION'	N(25)	N(6)	*	*	C(23)	P(19)
50 'APPLICATION OF EQUATIONS'	N(24)	*	C(3)	*	C(24)	*

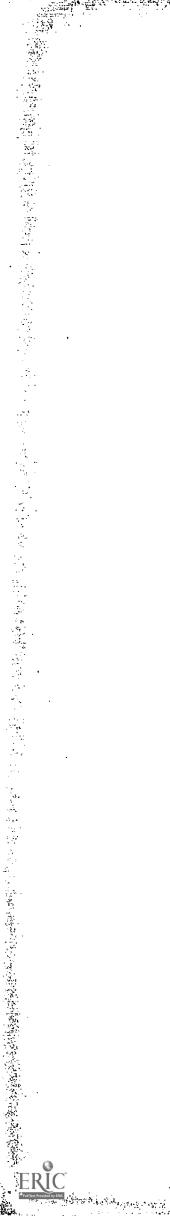| ITEMS	LOWER THAN PRE ALGEBRA	MATH A	MATH B	PRE ALGEBRA	ALGEBRA 1	GEOMETRY
51 'GENERATING EQUATIONS FROM DESCR.'	N(21)	C(6)	*	*	C(24)	*
52 'SOLV. EQUA. FROM FACTORED FORM'	N(25)	N(6)	N(3)	*	C(23)	*
53 'SOLVING QUAD.EQUAT.BY FACTORING '	N(25)	N(6)	*	*	C(23)	*
54 'SOLVING QUAD. EQUA. BY QUADRATIC '	N(25)	N(6)	N(3)	*	*	*
55 'GRAPHS OF QUADRATIC RELATIONS'	N(25)	*	*	*	*	N(18)
56 'ONE UNKNOWN WITH NUM. COEFFI.'	N(25)	*	*	*	C(24)	*
57 'SOLUT. OF QUADRATIC INEQUALITIES'	N(25)	*	*	*	*	*
58 'GRAPHING LIN. INEQ. IN ONE UNKNO'	N(25)	*	*	*	*	*
59 'SIMPLIF. OF A RATIONAL EXPRE.'	N(24)	C(6)	C(3)	C(24)	*	
60 'EVALUATION OF A RATIONAL EXPRE. '	N(23)	C(6)	C(3)	*	C(24)	*
61 ADD. & SUB. OF RATIONAL EXPRE.'	N(25)	*	*	*	C(24)	*
62 'MUL. & DIV. OF RATIONAL EXPRE.'	N(25)	*	*	*	C(24)	*
63 'PROBABILITY'	*	C(6)	C(3)	N(9)	*	N(20)
64 'DESCRIPTIVE STATISTICS'	*	C(6)	C(3)	N(9)	*	N(20)
65 'GRAPH READING'	*	*	*	*	*	*
66 'LOCATI. OF POINTS IN CORD. PLANE'	*	*	*	C(10)	*	C(18)
67 'DISTANCE BET. TWO POINTS IN COR.'	*	*	*	*	*	C(19)
68 'PERIMETER & AREA OF TRIANGLES,SQ'	*	*	*	C(11)	*	C(21)
69 'CIRCUMFERENCE & AREA OF CIRCLE'	*	*	*	C(11)	*	C(21)
70 'VOL. OF CUBES, CYLINDERS,RECTAN.'	*	*	*	C(9)	*	C(20)
71 'FINDING SUM OF INTERIOR ANGLES'	*	C(6)	C(3)	*	*	C(19)
72 'ISOSCELES & EQUILATERAL TRIANGLE'	*	C(6)	C(3)	*	*	C(19)
73 'APPLIC. , CONGRUENT TRIANGLES'	*	*	*	*	*	C(19)
74 'APPLIC. , SIMPLE TRIANGLES'	*	*	*	*	*	C(19)
75 'PYTHAGOREAN THEOREM & SPECI. TR.'	*	C(6)	*	C(10)	*	C(17)
76 'PARALLELISM & PERPENDICULARITY'	*	*	*	*	*	C(17)
77 'PROOFS(FORMAL DEDUCTIVE DEMONST.'	N(25)	N(6)	N(3)	N(10)	N(19)	C(17)
78 'TRANSFORMATIONS(TRANSLATION.'	N(25)	N(6)	N(3)	N(10)	N(22)	*
79 'VECTORS'	N(25)	N(6)	N(3)	N(11)	N(22)	N(21)
80 'SIMPLIF. & EVALU. OF EXPRESS.'	*	*	*	*	C(22)	*
81 'SOLUTION OF EQUATIONS'	*	*	*	*	C(22)	*
82 'FUNCT. CONCEPT & USE OF NOTATION'	N(25)	*	*	N(11)	*	*
83 'FUNCT. EVALUATION USING SUBSTIT.'	N(25)	*	*	N(11)	*	*
84 'COMPOSITION OF FUNCTION'	N(25)	N(6)	*	N(11)	*	N(17)
85 'GRAPHING OF FUNCTION'	N(25)	N(6)	*	N(11)	*	*
86. NUMERICAL FUNCTION EVALUATION'	N(25)	N(6)	N(3)	N(11)	*	N(20)
87 'SUBSTITUTING LITERAL EXPRESS.'	N(25)	N(6)	N(3)	N(11)	N(17)	N(18)
88 'DEFINITION, LAWS & RULES'	N(25)	N(6)	N(3)	N(11)	N(17)	N(21)
89 'INVERSE RELATION BET. LOG. & EXP'	N(25)	N(6)	N(3)	N(11)	N(17)	N(21)
90 'SOLUTION OF LOG. AND EXP. FUNCT.'	N(25)	N(6)	N(3)	N(11)	N(17)	N(21)
91 'GRAPHING OF LOG. AND EXP. FUNCT.'	N(25)	N(6)	N(3)	N(11)	N(17)	N(21)
92 'FIND. ALGEBRAIC EXPRESS'	N(25)	N(6)	N(3)	N(10)	N(18)	*
93 'DESCRIB. VARIATIONS OF FUNCTION '	N(25)	N(6)	N(3)	N(10)	N(18)	N(20)
94 'FIND. SIDE LENGTHS IN SPEC.TRIA.'	N(25)	*	*(3)	N(10)	N(18)	*
95 'GRAPHING TRIGONOMETRIC FUNCTIONS'	N(25)	N(6)	N(3)	N(11)	N(18)	N(20)
96 'REDUCING TRIGONOMETRIC EXPRE.'	N(25)	N(6)	N(3)	N(11)	N(18)	N(20)
97 'PROOF OF TRIGONOMETRIC IDENTITIE'	N(25)	N(6)	N(3)	N(11)	N(18)	N(20)

Attachment 3

Table 3. Average P-values by teachers' reports of topic coverage on the MDTP Algebra Readiness, Elementary Algebra tests and the SIMS Benchmark test.

Teachers' Report of Topic Coverage	Average P-values (Number of Test Items)* Number of Teachers / Avg. Number of Students**					
	MDTP ALGEBRA READINESS		MDTP ELEMENTARY ALGEBRA		SIMS BENCHMARK	
	'89	'88	'89	'88	'89	'88
A. Taught as New	.41(50) 10/326	.42(50) 25/563	.46(48) 8/183	.45(46) 16/497	.44(39) 10/160	.36(38) 25/99
B. Extended & Reviewed	.41(44) 7/330	.41(46) 22/550	.45(31) 7/178	.47(47) 16/515	.42(32) 7/159	.35(34) 22/100
C. Reviewed only	.41(34) 6/333	.41(43) 13/542	.47(40) 7/186	.47(46) 11/510	.43(15) 6/211	.33(28) 11/87
D. Assumed as Prereq.	.47(17) 1/394	.34(4) 2/454	.46(44) 6/184	.46(49) 10/513	.48(9) 1/207	.38(22) 1/121
E. Taught Later	.42(25) 6/330	.41(35) 18/553	.43(23) 6/174	.45(31) 12/505	.44(29) 6/170	.36(37) 18/100
F. Not in Curriculum	.36(19) 3/286	.40(17) 8/551	.37(4) 2/158	.41(12) 1/465	.45(27) 3/153	.38(23) 9/100
G. Don't know	– – –	.32(8) 3/441	.42(13) 1/164	.47(16) 1/533	– – –	.33(8) 6/72
H. No Response	.38(16) 1/290	.38(19) 5/503	.47(8) 1/185	.43(23) 2/475	.45(27) 2/153	.36(32) 5/94

* 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 appear in a given topic coverage category multiplied by the number of students who answered correctly and are averaged across items. For example, the average P-value for Review Only on the MDTP Algebra Readiness Test is .41 across the 43 items where thirteen teachers chose "Reviewed Only" to describe coverage of the topic.

** The number of students are averaged by dividing by the number of items which are assigned to topic categories.