# THE MATHEMATICS TEACHER

An Official Journal of
The National Council of Teachers of Mathematics
(Incorporated)



## Classified Index Volume LVIII 1965

EDITORIAL OFFICE

Irvin H. Brune, Bowling Green State University, Bowling Green, Ohio ALBRECHT, ROBERT L. Computers for school mathematics. May, 393-401.

ALLENDOERFER, CARL B. Angles, arcs, and Archimedes. Feb., 82-88.

. The second revolution in mathematics. Dec., 690-95.

Andres, Richard. Topology. Jan., 30.

ATCHINSON, WILLIAM F. Computers for school mathemtics. May, 393-401.

AVELLONE, JOSEPH H. Geometrics. May, 407. AVILA, RAMON L. Review of Intermediate Algebra, Wooton and Drooyan; Wadsworth Publishing Company, 1962. Feb., 156-57.

BARNETT, I. A. Introducing number theory in high school algebra and geometry, Part 1:

Algebra. Jan., 14-23.

. Introducing number theory in high school algebra and geometry, Part 2: Geome-

try. Feb., 89-101.

. The ubiquitous number five. Oct., 511. BENZ, HARRY E. Review of Other Bases in Arithmetic, Marks, Smart, and Purdy; Ginn, 1962. Feb., 158-59.

BISHOP, DAVID C. A mathematical diversion.

Oct., 527.

Bold, Benjamin. A general test for divisibility by any prime (except 2 and 5). Apr., 311-12.

Botts, Truman. Problem solving in mathematics, I. Oct., 496-501.

-. Problem solving in mathematics, II. Nov., 596-600.

BOYER, CARL B. Johann Hudde and space coordinates. Jan., 33-36.

BROTHER T. BRENDAN. How Ptolemy constructed trigonometry tables. Feb., 141-49.

Brown, Stephen I. Of "prime" concern: What domain? May, 402-7.

BRUNE, IRVIN H. Authors please note. Jan.,

 Makers of a magazine. Dec., 730-31. -. Transition and appreciation. Oct., 521.

BUCHANAN, O. LEXTON, JR. Opinions of college teachers of mathematics regarding content of the twelfth-year course in mathematics. Mar.,

CAHEN, LEONARD S. An interim report on the national longitudinal study of mathematical abilities. Oct., 522-26. (See also Letter to the

editor, Nov., 659.)

CALL, JERRY E. Review of First Course in Modern Algebra, Koo, Blyth, and Burchenal; Frederick Ungar Publishing Co., 1963. Feb.,

Callanan, Cecelia. Zero. Dec., 738.

CARPENTER, DOROTHY I. Adam Reise. Oct., 538-43.

CHARP, SYLVIA. Computers for school mathematics. May, 393-401.

CHERKASOV, R. S. The development of the teaching of mathematics in Soviet schools. Dec., 715-19.

Chow Chi-Ming. The relation between distance and sight area. Apr., 298-302.

CRUMLEY, RICHARD D. Review of Theory of Arithmetic, Peterson and Hashisaki; John Wiley, 1963. May, 455-56.

D'Augustine, Charles H. Definitions without exceptions. Mar., 221-22.

Dennis, J. Richard. Review of A Modern Introduction to Basic Mathematics, Keedy; Addison-Wesley, 1963. Dec., 732-33.

DE WANE, EVERMODE T., O. PRAEM. Use of discriminant analysis for selecting students for ninth-grade algebra or general mathematics. May, 412-16.

DICK, WALTER. Retention as a function of paired and individual use of programmed in-

struction. Nov., 649-54.

DUNCAN, DEWEY C. Ten mathematical refreshments. Feb., 102-8.

Duncan, Hilda F. Fermat's last theorem. Apr., 321-22.

EASTERDAY, KENNETH E. A technique for low achievers. Oct., 519-21.

Elkin, Jack M. A deceptively easy problem. Mar., 194-99.

 Eves, Howard. Editor. Historically speaking,
 Jan., 33-36; Feb., 141-49; Mar., 244-50; Apr., 334-44; May, 441-47; Oct., 538-43; Nov., 630-36; Dec., 720-23.

FEHR, HOWARD F. Editor. International mathematical education. Jan., 37-44; Feb., 150-55; Mar., 251-57; Apr., 345-52; May, 448-53; Oct., 528-35; Nov., 637-41; Dec., 715-19.

Reform of mathematics education

around the world. Jan., 37-44.

Feiner, Henri. Divisibility test for 7. May, 429 - 30.

Feinstein, Leonore. The disconnection. Feb., 101.

FEJFAR, JAMES L. Review of Topics in Mathematics, 29th Yearbook; National Council of Teachers of Mathematics, 1964. Nov., 655-56.

FELDER, VIRGINIA. Review of Subsets of the Plane: Plane Analytic Geometry, Taylor and Wade; John Wiley, 1962. Feb., 159.

FELIX, LUCIENNE. The development of the teaching of mathematics in France at the first and second degree levels. Nov., 637-41.

FISCHER, IRENE. How far is it from here to there? Feb., 123-30.

FORSYTHE, ALEXANDRA. Computers for school mathematics. May, 393-401.

FREDLAND, ELLIOTT D. Review of Enrichment Program for Junior High School, Marks, Smart, and Purdy; Ginn, 1962. May, 454.

. Review of Modern Mathematics: Topics and Problems, Aiken and Beseman; Webster Division, McGraw-Hill, 1964. Feb., 158.

Review of The "New" Math for Teachers and Parents of Elementary School Children, Barker, Curran, and Metcalf; Fearon Publishers, 1964. May, 454.

GAFNEY, LEO. Gaspard Monge and descriptive geometry. Apr., 338-44.

GIBAT, NORMAN E. Grading Nomogram. Nov., 595.

GLICKSMAN, ABRAHAM M. Vectors in algebra and geometry. Apr., 327-32.

GUGGENBUHL, LAURA. Mathematics in ancient Egypt: a checklist (1930-65). Nov., 630-34.

HAAS, VICTOR E. Addition and subtraction on the soroban. Nov., 608-21.

HALEY, MIKE. The unsung sum of things. Nov.,

HAMADANIZADEH, JAVAD. Applied mathematics in eleventh-century Iran: Abū Ja'far's determination of the solar parameters. May, 441-

Hanawalt, Kenneth. The end of a perfect number. Nov., 621-22.

HANNON, HERBERT. A note on measurement. May, 431-32.

HEIDLAGE, MARTHA. A coordinate approach to the 25-point miniature geometry. Feb., 109-

HOAG, JESSIE MAY. Review of Teaching Arithmetic in the Primary Grades, Hollister and Gunderson; D. C. Heath, 1964. Nov., 656.

HOFFMAN, WALTER. Computers for school mathematics. May, 393-401.

HORTON, GEORGE W. A Boolean switchboard. Mar., 211-20.

Hoy, Dorothy H. Reflexive, symmetric, and transitive properties of relations. Mar., 205-

IVANOFF, JOHN M. Use of discriminant analysis for selecting students for ninth-grade algebra or general mathematics. May, 412-16.

James, Stanley R. Review of Updating Mathematics, Mueller, Editor; Croft Educational Services, 1964. May, 456-57.

JORDAN, JOHN Q. Divisibility tests of the non-

congruence type. Dec., 709-12.

KALMAN, KARL S. Review of Elementary Concepts of Modern Mathematics, Dinkiness; Appleton-Century-Crofts, 1964. Dec., 734.

KANER, SAMUEL. A compass-ruler method for constructing ellipses on graph paper. Mar., 260-61.

KARNES, HOUSTON T. Minutes of the Annual Business Meeting. Oct., 545-49.

KATTSOFF, LOUIS O. A recursion formula for solving n linear equations in n variables. Apr., 295-97.

KAY, G. RICHARD. Project Idaho. Mar., 241-43. Kellems, Robert L. Effectiveness of programmed teaching in college algebra. May, 434-36.

KENNEDY, E. S. Applied mathematics in eleventh-century Iran: Abū Ja'far's determination of the solar parameters. May, 441-

KESTILÄ, ESTHER. Review of Finite Mathematical Structures, Yarnelle; D. C. Heath, 1964. Mar., 258-59.

. Review of An Introduction to Transfinite Mathematics, Yarnele; D. C. Heath, 1964. Mar., 258.

-. Review of Principles and Patterns of Numeration Systems, Archer; Ginn, 1964.

KINSEY, DAVID W. Review of Precalculus Mathematics, Meyer; D. Van Nostrand, 1964. Dec., 736.

KRABILL, ESTHER. Review of Using Modern Mathematics, Urbancek and Urbancek; Society for Visual Education. May, 457.

LAYCOCK, MARY. Review of Fundamental Con-

cepts of Mathematics, Harmon and Dupree; Prentice-Hall, 1964. Dec., 736.

LEDBETTER, DAVID A. Review of Modern Intermediate Algebra, Nichols, Heimer, and Garland; Holt, Rinehart & Winston, 1965. Dec., 733-34.

LLOYD, DANIEL B. Finding nonlinear factors of polynomials by modular methods. Oct., 502-6 . Recent evidences of primeval mathe-

matics. Dec., 720-723.

LOEB, A. L. Remarks on some elementary volume relations between familiar solids. May, 417-19.

Maccia, Alex. Factoring using a square array. May, 458-60.

Manheim, Jerome H. Connectionism and the teaching machine. Mar., 200-204.

MANHEIM, SYLVIA R. Connectionism and the

teaching machine. Mar., 200-204.

MENTZER, RICHARD L. Review of New Curricula, A Report on the Methods and Programs for Teaching Science and the Humanities Which Promise to Revolutionize American Education, Heath, Editor; Harper & Row, 1964. Feb., 158.

MESERVE, BRUCE E. The NCTM: Its growth

and growing pains. Oct., 490-95.

MUELLER, FRANCIS J. More on Pascal's Triangle and powers of 11. May, 425-28.

NELSON, L. DOYAL. Textbook difficulty and mathematics achievement in junior high school. Dec., 724-29.

NICHOLS, EUGENE D. Editor. Experimental programs. Feb., 131-38; May, 434-36; Oct., 522-26; Nov., 642-48; Dec., 724-29.

NICHOLS, THOMAS D. Intersection and union word puzzle. Jan., 28-29.

NIEBAUM, JEROME. A digital problem for 1965. Dec., 713-14.

O'BRIEN, KATHARINE. Collected mathematical poems. Oct., 536-37.

-. Undefined terms. Apr., 315.

PAPY, G. Methods and techniques of explaining new mathematical concepts in the lower forms of secondary schools, Part 1. Apr., 345-52.

-. Methods and techniques of explaining new mathematical concepts in the lower forms of secondary schools, Part 2. May, 448-53.

PAYNE, HOLLAND. What about modern programs in mathematics? May, 422-24.

PAYNE, JOSEPH N. Editor. Tips for beginners. Jan., 47-49; Mar., 260-61; May, 458-60.

PEAK, PHILIP. Editor. Have you read? Jan., 31-32; Feb., 139-40; Apr., 333; May, 437-40; Nov., 658-59; Dec., 737-38.

PEDEN, IRENE C. The missing half of our technical potential: Can we motivate the girls? Jan., 2-13.

PEDLEY, ARTHUR H. A radical approach to  $\sqrt{ab} = \sqrt{a}\sqrt{b}$ . Oct., 512-13.

PERHAM, FATHER ARNOLD, C.S.V. An exercise for the mathematics laboratory. Feb., 114-17.

Perisho, Clarence R. The use of transformations in deriving equations of common geometric figures. May, 386-92.

Perry, Marcia. Dabar, logos, and shihh. Jan., 24 - 25.

PHILLIPS, J. P. The history of the dodecahedron. Mar., 248-50.

PIXLEY, LOREN W. Archimedes. Nov., 634-36. Pochanayon, Sam. I am mysterious. May, 432. PROCTOR, AMELIA D. A world of hope-helping slow learners enjoy mathematics. Feb., 118-

22.

PRZYBOCKI, JOHN. Review of Decimals and Percentage, Friel; Doubleday, 1964. Mar., 258. Review of New Plane Geometry and Supplements, Hart, Schult, and Swain; D. C. Heath, 1964. May, 454-55.

Råde, Lennart. A course in probability theory

for secondary schools. Oct., 528-35.

RAMSDELL, PAUL R. Review of Introduction to Secondary Mathematics, Vol. I, Haag and Dudley; D. C. Heath, 1964. Dec., 734-35.

RINDUNG, OLE. The new mathematics program in the Danish gymnasium. Feb., 150-55.

RINGENBERG, LAWRENCE A. A portrait of  $\sqrt{2}$ . Nov., 586-95.

Rosenberg, Edwin A. Checking computations in nondecimal bases. May, 408-11.

ROSENTHAL, EVELYN B. A scale for "scaleneness." Apr., 318-20.

ROTANDO, LOUIS M. Continued square roots. Oct., 507-8.

RUCKER, ISABELLE P. Review of Second Course in Algebra, Weeks and Adkins; Ginn, 1962. Apr., 360-61.

Sassé, Katharine J. S. Mathematics for the noncollege-bound in junior high school. Mar.,

232-40.

SCANDURA, JOSEPH M. Educational research and the mathematics educator. Feb., 131-38.

SEGUIN, CHARLES P. Commuting linear functions and fixed points. Dec. 702-4.

Sharpe, Benjamin B. A reachable research area. May, 420-21.

SHELTON, RONALD M. Review of Seeing Through Mathematics, Book 3, Van Engen, Hartung, Trimble, Berger, and Cleveland; Scott, Foresman, 1964. Dec., 734.

SIEMENS, DAVID F., JR. The mathematics of

the honeycomb. Apr., 334-37.

SIMONE, ALBERT J. A recursion formula for solving n linear equations in n variables. Apr., 295-97.

SINGER, ARNOLD. On determining a linear combination of a set of variables from a given system of linear equations. May, 433.

SISTER M. BARBARA STASTNY, O.S.F. Divisibility patterns in number bases. Apr., 308-10.

SISTER M. FRANCIS BORGIA, S.S.N.D. Review of Some Lessons in Mathematics, Association of Teachers of Mathematics; Cambridge University Press, 1964. Apr., 361.

SISTER MARY COLUM, O.P. Review of Modern Elementary Mathematics, Ward and Hardgrove; Addision-Wesley, 1964. Nov., 656-57.

SLANINKA, ARDYS. Review of The New Mathematics (7 & 8), Weber and Weber; McCormick-Mathers, 1964. Dec., 732.

SLOOK, THOMAS H. Integers which are differences of squares. Jan., 26-27.

SMITH, LEANDER W. Conditions governing numerical equality of perimeter, area, and volume. Apr., 303-7.

-. The use and abuse of programed instruction. Dec., 705-8.

SNYDER, HENRY D. Deductive proof of compass-ruler method for constructing ellipses. Mar., 261.

STEINER, HANS-GEORG. Relations and functions. Mar., 251-57.

STIEL, EDSEL F. Relations and functions. Nov., 623 - 28.

STONE, EDWARD J. New domains. Oct., 514-17. STONE, MARSHALL H. Review of Goals for School Mathematics: The Report of the Cambridge Conference on School Mathematics; Houghton Mifflin, 1963. Apr., 353-60.

STROW, FLOYD D. Review of One Hundred Problems in Elementary Mathematics, Steinhaus; Basic Books, 1964. Mar., 259.

Sueltz, Ben A. Legibility of mathematical tables: the Babbage experiments of 1827. May, 446-47.

SZABO, STEVEN. Review of Introduction to Secondary Mathematics, Vol. II, Haag and Dudley; D. C. Heath, 1965. Dec., 735.

TAYLOR, HOWARD E. On the meaning of structure in mathematics. Mar., 226-31.

THOMAS, GERALD R. Precision, accuracy, and other ambiguities. Oct., 509-11.

THOMPSON, ROBERT A. Using high school algebra and geometry in Doppler satellite tracking. Apr., 290-94.

THUMM, WALTER. Buffon's needle: stochastic determination of  $\pi$ . Nov., 601-7.

TINNAPPEL, HAROLD E. Editor. Reviews and evaluations. Feb., 156-59; Mar., 258-59; Apr., 353-61; May, 454-57; Nov., 655-57; Dec., 732-36.

TOPOLY, WILLIAM. An introduction to solving problems. Jan., 48-49.

TREDWAY, DAN. The secondary teacher and elementary school mathematics. Apr., 313-15.

TURNER, NURA D. Additions to an annotated bibliography for careers in mathematics. Oct., 517 - 18.

VAUGHAN, HERBERT E. An illustration of the use of vector methods in geometry. Dec., 696-701.

VIERTEL, WILLIAM K. Some really new "new mathematics." Oct., 501.

Wade, Thomas L. On the meaning of structure in mathematics. Mar., 226-31.

WALTON, HOWARD L. An examination of the differences resulting from iteration. Apr., 316-17.

WEINNINGER, MAGNUS. The world of polyhedra. Mar., 244-48.

WICK, MARSHALL E. A study of the factors associated with success in first-year college mathematics. Nov., 642-48.

WISEMAN, JOHN D., JR. Complex contrapositives. Apr., 323-26.

WOLFE, MARTIN S. Review of A New Look at Arithmetic, Adler; John Day, 1964. Nov., 657.

Wong, Ruth E. M. Review of New Approaches to Mathematics Teaching, Land; St. Martin's Press, 1965. Nov., 655.

WOODBY, LAUREN G. Project Idaho. Mar., 241-

43.

#### Title index

Addition and subtraction on the soroban. VICTOR E. HAAS. Nov., 608-21.

Additions to an annotated bibliography for careers in mathematics. Nura D. Turner. Oct., 517-18.

Aids for evaluators of mathematics textbooks. May, 467-73.

Angles, arcs, and Archimedes. CARL B. ALLEN-DOERFER. Feb., 82-88.

Annual financial report. Dec., 742-43

Applied mathematics in eleventh-century Iran:
Abū Ja'far's determination of the solar
parameters. E. S. Kennedy and Javad
Hamadanizadeh. May, 441-46.

Archimedes. Loren W. Pixley. Nov., 634-36. Articles of Incorporation. Nov., 664-65.

Authors please note. IRVIN H. BRUNE. Jan., 45-46.

A Boolean switchboard. George W. Horton. Mar., 211-20.

Buffon's needle: stochastic determination of π. Walter Thumm. Nov., 601-7.

Bylaws. Nov., 665-67.

Checking computations in nondecimal bases. EDWIN A. ROSENBERG. May, 408-11.

Classified index, Volume LVIII, 1965, 745-55.
Collected mathematical poems. Katharine
O'Brien. Oct., 536-37.

Committees and Representatives (1964-1965), Supplementary list, Apr., 362-63.

Commuting linear functions and fixed points. Charles P. Seguin. Dec., 702-4.

A compass-ruler method for constructing ellipses on graph paper. Samuel Kaner. Mar., 260-61.

Complex contrapositives. John D. Wiseman, Jr. Apr., 323-26.

Computers for school mathematics. Walter Hoffman, Robert L. Albrecht, William F. Atchinson, Sylvia Charp, and Alexandra Forsythe. May, 393-401.

Conditions governing numerical equality of perimeter, area, and volume. Leander W.

Sмітн. Apr., 303-7.

Connectionism and the teaching machine.

JEROME H. MANHEIM and SYLVIA R. MANHEIM. Mar., 200-204.

Continued square roots. Louis M. Rotando. Oct., 507-8.

A coordinate approach to the 25-point miniature geometry. Martha Heidlage. Feb., 109-13.

A course in probability theory for secondary schools. Lennart Råde. Oct., 528-35.

Dabar, logos, and shhhh. MARCIA PERRY. Jan., 24-25.

A deceptively easy problem JACK M. ELKIN. Mar., 194-99.

Deductive proof of compass-ruler method for

WRIGHT, FRANK. Motivating students with projects and teaching aids. Jan., 47-48.

Yamin, Robert A. Review of Modern Algebra— A Logical Approach, Pearson and Allen Ginn, 1964. Feb., 157-58.

constructing ellipses. Henry D. Snyder. Mar., 261.

Definitions without exceptions. Charles H. D'Augustine, Mar., 221-22.

On determining a linear combination of a set of variables from a given system of linear equations. Arnold Singer. May, 433.

The development of the teaching of mathematics in France at the first and second degree levels. Lucienne Felix. Nov., 637-41.

The development of the teaching of mathematics in Soviet schools. R. S. Cherkasov. Dec., 715-19.

A digital problem for 1965. JEROME NIEBAUM. Dec., 713-14.

The disconnection. LEONORE FEINSTEIN. Feb., 101.

Divisibility patterns in number bases. Sister M. Barbara Stastny, O.S.F. Apr., 308-10.

Divisibility test for 7. HENRI FEINER. May, 429-30.

Divisibility tests of the noncongruence type. John Q. Jordan. Dec., 709-12.

Educational research and the mathematics educator. Joseph M. Scandura. Feb., 131– 38.

Effectiveness of programmed teaching in college algebra. Robert L. Kellems. May, 434-36.

The end of a perfect number. Kenneth Hanawalt. Nov., 621-22.

An examination of the differences resulting from iteration. Howard L. Walton. Apr., 316-17.

An exercise for the mathematics laboratory. FATHER ARNOLD PERHAM, C.S.V. Feb., 114-17.

Experimental programs. EUGENE D. NICHOLS. Editor. Feb., 131-38; May, 434-36; Oct., 522-26; Nov., 642-48; Dec., 724-29.

Factoring using a square array. ALEX MACCIA. May, 458-60.

Federal funs for the improvement of mathematics education. Oct., 551-54.

Fermat's last theorem. HILDA F. DUNCAN. Apr., 321-22.

Finding nonlinear factors of polynomials by modular methods. Daniel B. Lloyd. Oct., 502-6.

A general test for divisibility by any prime (except 2 and 5). Benjamin Bold. Apr., 311-12. Geometrics. Joseph H. Avellone, May, 407.

Grading Nomogram. NORMAN E. GIBAT. Nov., 595.

Have you read? Philip Peak. Editor. Jan., 31-32; Feb., 139-40; Apr., 333; May, 437-40; Nov., 658-59; Dec., 737-38.

Historically speaking,—. Howard Eves. Editor. Jan., 33-36; Feb., 141-49; Mar., 244-50; Apr., 334-44; May, 441-47; Oct., 538-43; Nov., 630-36; Dec., 720-23. The history of the dodecahedron. J. P. PHILLIPS. Mar., 248-50.

How far is it from here to there? IRENE FISCHER. Feb., 123-30.

How Ptolemy constructed trigonometry tables. BROTHER T. BRENDAN. Feb., 141-49.

Johann Hudde and space coordinates. CARL B. Boyer. Jan., 33-36.

I am mysterious. Sam Pochanayon. May, 432. An illustration of the use of vector methods in geometry. Herbert E. Vaughan. Dec., 696-701.

Integers which are differences of squares.

THOMAS H. SLOOK. Jan., 26-27.

An interim report on the national longitudinal study of mathematical abilities. Leonard S. CAHEN. Oct, 522-26. (See also Letter to the editor. Nov., 659.)

International mathematical education. Howard F. Fehr. Editor. Jan., 37-44; Feb., 150-55; Mar., 251-57; Apr., 345-52; May, 448-53; Oct., 528-35; Nov., 637-41; Dec., 715-19.

Intersection and union word puzzle. Thomas D.

Nichols. Jan., 28-29.

Introducing number theory in high school algebra and geometry, Part 1: Algebra. I. A. BARNETT. Jan., 14-23.

Introducing number theory in high school algebra and geometry, Part 2: Geometry. I. A. BARNETT. Feb., 89-101.

An introduction to solving problems. WILLIAM TOPOLY. Jan., 48-49.

Joint meeting-National Council of Teachers of Mathematics with the National Education Association, June 29, 1965. May, 430.

Legibility of mathematical tables: the Babbage experiments of 1827. BEN A. SUELTZ. May,

Letters to the editor. Jan., 36; Mar., 231; Apr., 312; Oct., 495; Nov., 659.

MAA meetings. May, 436.

Makers of a magazine. IRVIN H. BRUNE. Dec., 730-31.

Mathematics in ancient Egypt: a checklist (1930-65). LAURA GUGGENBUHL. Nov., 630-34.

A mathematical diversion. DAVID C. BISHOP. Oct., 527.

The mathematics of the honeycomb. DAVID F. SIEMENS, JR. Apr., 334-37.

Mathematics for the noncollege-bound in junior high school. Katharine J. S. Sassé. Mar., 232-40.

On the meaning of structure in mathematics. HOWARD E. TAYLOR and THOMAS L. WADE. Mar., 226-31.

Methods and techniques of explaining new mathematical concepts in the lower forms of secondary schools, Part 1. G. Papy. Apr.,

Methods and techniques of explaining new mathematical concepts in the lower forms of secondary schools, Part 2. G. PAPY. May., 448 - 53.

Minutes of the Annual Business Meeting. HOUSTON T. KARNES. Oct., 545-49.

The missing half of our technical potential: Can we motivate the girls? IRENE C. PEDEN. Jan., 2-13.

Gaspard Monge and descriptive geometry. LEO GAFNEY. Apr., 338-44.

More on Pascal's Triangle and powers of 11. FRANCIS J. MUELLER. May, 425-28.

Motivating students with projects and teaching aids. Frank Wright. Jan., 47-48.

My dearest Évariste. Apr., 332.

NCTM Affiliated Group Officers and Editors. CLARENCE H. HEINKE. Feb., 160-70.

The NCTM: Its growth and growing pains. Bruce E. Meserve. Oct., 490-95.

NCTM Projects and Panels, Supplementary list, January, 1965. Apr., 362.

NCTM representatives. May, 461-66. NCTM—summer meeting. May, 428.

New domains. Edward J. Stone. Oct., 514-17. The 1965-66 Budget. Oct., 550.

The new mathematics program in the Danish gymnasium. Ole Rindung. Feb., 150-55.

A note on measurement. HERBERT HANNON. May, 431-32.

Opinions of college teachers of mathematics regarding content of the twelfth-year course in mathematics. O. LEXTON BUCHANAN, JR. Mar., 223-25.

Points and viewpoints. Jan., 45-56; Oct., 521; Dec., 730-31.

A portrait of  $\sqrt{2}$ . Lawrence A. Ringenberg. Nov., 586-95.

Precision, accuracy, and other ambiguities. GERALD R. THOMAS. Oct., 509-11.

Problem solving in mathematics, I. Truman Botts. Oct., 496-501.

Problem solving in mathematics, II. TRUMAN Botts. Nov., 596-600.

Of "prime" concern: What domain? STEPHEN I. Brown. May, 402-7.

Proceedings of the Sixteenth Annual Delegate Assembly. Dec., 739-41.

Project Idaho. G. RICHARD KAY and LAUREN G. Woodby. Mar., 241-43.

Proposed amendments to bylaws with explanatory notes. Mar., 262-64.

A radical approach to  $\sqrt{ab} = \sqrt{a}\sqrt{b}$ . ARTHUR H. Pedley. Oct., 512-13.

A reachable research area. Benjamin Sharpe. May, 420-21.

Recent evidences of primeval mathematics. Daniel B. Lloyd. Dec., 720-23.

A recursion formula for solving n linear equations in n variables. Louis O. Kattsoff and ALBERT J. SIMONE. Apr., 295-97.

Reflexive, symmetric, and transitive properties of relations. Dorothy H. Hoy. Mar., 205-10. Reform of mathematics education around the

world. Howard F. Fehr. Jan., 37-41. The relation between distance and sight area.

Снож Сні-Мінд. Арг., 298-302. Relations and functions. HANS-GEORG STEINER.

Mar., 251-57. Relations and functions. EDSEL F. STIEL. Nov.,

Remarks on some elementary volume relations between familiar solids. A. L. LOEB. May, 417 - 19.

623 - 28.

Report of the Nominating Committee. Jan.,

Retention as a function of paired and individual

use of programmed instruction. WALTER Dick. Nov., 649-54.

Reviews and evaluations. HAROLD E. TINNAP-FEL. Editor. Feb., 156-59; Mar., 258-59; Apr., 353-61; May, 454-57; Nov., 655-57; Dec., 732 - 36.

Adam Riese. DOROTHY I. CARPENTER. Oct., 538-43.

A scale for "scaleneness." EVELYN B. ROSEN-THAL. Apr., 318-20.

The second revolution in mathematics. CARL B. Allendoerfer. Dec., 690-95.

The secondary teacher and elementary school mathematics. Dan Tredway. Apr., 313-15. Some really new "new mathematics." WILLIAM

K. VIERTEL. Oct., 501.

A study of the factors associated with success in first-year college mathematics. Marshall E. WICK. Nov., 642-48.

A technique for low achievers. Kenneth E. EASTERDAY. Oct., 519-21.

Ten mathematical refreshments. Dewey C.

Duncan. Feb., 102-8. Textbook difficulty and mathematics achievement in junior high school. L. DOYAL NELSON. Dec., 724-29.

Tips for beginners. Joseph N. Payne. Editor. Jan., 47-49; Mar., 260-61; May, 458-60.

Topology. RICHARD ANDRES. Jan., 30.

Transition and appreciation. IRVIN H. BRUNE. Oct., 521.

The ubiquitous number five. I. A. BARNETT. Oct., 511.

Undefined terms. KATHARINE O'BRIEN. Apr.,

The unsung sum of things. MIKE HALEY. Nov., 629.

The use and abuse of programmed instruction. LEANDER W. SMITH. Dec., 705-8.

Use of discriminant analysis for selecting students for ninth-grade algebra or general mathematics. John M. Ivanoff, Evermode T. DE WANE, O. PRAEM. May, 412-16.

The use of transformations in deriving equations of common geometric figures. Clarence

R. Регівно. Мау, 386-92. Using high school algebra and geometry in Doppler satellite tracking. ROBERT A. THOMPson. Apr., 290-94.

Vectors in algebra and geometry. Abraham M. GLICKSMAN. Apr., 327-32.

What about modern programs in mathematics? HOLLAND PAYNE. May, 422-24.

What's new? Jan., 13; May, 411; Nov., 654, 662; Dec., 741.

A world of hope-helping slow learners enjoy mathematics. Amelia D. Proctor. Feb., 118-22.

The world of polyhedra. Magnus Wenninger. Mar., 244-48.

Your professional dates. Jan., 59-60; Feb., 170-71; Mar., 264-65; Apr., 363-64; May, 474; Oct., 554-55; Nov., 668; Dec., 744.

Zero, Cecelia Callanan, Dec., 738.

### Subject index

ABILITY GROUPING

A technique for low achievers, 519-21. A world of hope-helping slow learners enjoy mathematics, 118-22.

ALGEBRA

Miscellaneous

Effectiveness of programmed teaching in college algebra, 434-36.

An examination of the differences resulting

from iteration, 316-17.

Introducing number theory in high school algebra and geometry, Part 1: Algebra,

Introducing number theory in high school algebra and geometry, Part 2: Geometry, 89-101.

A recursion formula for solving n linear equations in n variables, 295-98.

Using high school algebra and geometry in Doppler satellite tracking, 290-94.

Teaching methods

An introduction to solving problems, 48-49. A radical approach to  $\sqrt{ab} = \sqrt{a}\sqrt{b}$ , 512-13.

Topics in

A Boolean switchboard, 211-20.

Checking computations in nondecimal bases, 408-11.

Commuting linear functions and fixed points, 702-4.

Continued square roots, 507-8.

On determining a linear combination of a

set of variables from a given system of linear equations, 433.

Factoring using a square array, 458-60.

Finding nonlinear factors of polynomials by modular methods, 502-6.

Legibility of mathematical tables: the Babbage experiments of 1827, 446-47.

On the meaning of structure in mathematics, 226-31.

More on Pascal's Triangle and powers of 11, 425-28.

Reflexive, symmetric, and transitive properties of relations, 205-10.

Relations and functions, 251-57; 623-28. Vectors in algebra and geometry, 327-32.

APPLICATIONS

Business and consumer

Additions to an annotated bibliography for careers in mathematics, 517-18.

Miscellaneous

An exercise for the mathematics laboratory, 114-17.

Science and engineering

Applied mathematics in eleventh-century Iran: Abū Ja'far's determination of the solar parameters, 441-46.

The mathematics of the honeycomb, 334-37.

The relation between distance and sight area, 298-302.

Using high school algebra and geometry in Doppler satellite tracking, 290-94.

ARITHMETIC

Miscellaneous

Adam Riese, 538-43.

The secondary teacher and elementary school mathematics, 313-15.

Teaching methods

Definitions without exceptions, 221-22. A technique for low achievers, 519-21.

Topics in

Checking computations in nondecimal bases, 408-11.

Divisibility tests of the noncongruence type, 709-12.

ASTRONOMY

Applied mathematics in eleventh-century Iran: Abū Ja'far's determination of the solar parameters, 441-46.

CALCULATORS AND COMPUTERS

Addition and subtraction on the soroban, 608-21.

Computers for school mathematics, 393-401.

CALCULUS

Miscellaneous

Conditions governing numerical equality of perimeter, area, and volume, 303-7.

The relation between distance and sight area, 298-302.

Some really new "new mathematics," 501.

Buffon's needle: stochastic determination of  $\pi$ , 601-7.

CALENDARS

MAA meetings, 436.

CURRICULUM

College

A study of the factors associated with success in first-year college mathematics, 642-48.

High school

An interim report on the national longitudinal study of mathematical abilities, 522-26. (See also Letter to the editor, 659.)

Computers for school mathematics, 393-401.

Methods and techniques of explaining new mathematical concepts in the lower forms of secondary schools, Part 1, 345-52.

Methods and techniques of explaining new mathematical concepts in the lower forms of secondary schools, Part 2, 448-53.

The new mathematics program in the Danish gymnasium, 150-55.

Opinions of college teachers of mathematics regarding content of the twelfth-year course in mathematics, 223-25.

A technique for low achievers, 519-21.

Junior high school

A course in probability theory for secondary schools, 528-35.

An interim report on the national longitudinal study of mathematical abilities, 522-26. (See also Letter to the editor, 659.)

Mathematics for the noncollege-bound in junior high school, 232-40.

Textbook difficulty and mathematics

achievement in junior high school, 724-29.

Miscellaneous

The development of the teaching of mathematics in France at the first and second degree levels, 637-41.

The development of the teaching of mathematics in Soviet schools, 715-19.

Reform of mathematics education around the world, 37-44.

The second revolution in mathematics, 690-95.

What about modern programs in mathematics?, 422-24.

EVALUATIONS

An interim report on the national longitudinal study of mathematical abilities, 522-26. (See also Letter to the editor, 659.)

Use of discriminant analysis for selecting students for ninth-grade algebra or general mathematics, 412–16.

GENERAL MATHEMATICS

Teaching methods

A technique for low achievers, 519-21.

GEOMETRY

Miscellaneous

Continued square roots, 507-8.

Introducing number theory in high school algebra and geometry, Part 2: Geometry, 89-101.

The relation between distance and sight area, 298-302.

Using high school algebra and geometry in Doppler satellite tracking, 290–94. Topics in

Angles, arcs, and Archimedes, 82-88.

A compass-ruler method for constructing ellipses on graph paper, 260-61.

Complex contrapositives, 323-26.

Conditions governing numerical equality of perimeter, area, and volume, 303-7.

A coordinate approach to the 25-point miniature geometry, 109-13.

A deceptively easy problem, 194-99.

Deductive proof of compass-ruler method for constructing ellipses, 261.

The history of the dodecahedron, 248-50. Johann Hudde and space coordinates, 33-36.

An illustration of the use of vector methods in geometry, 696-701.

The mathematics of the honeycomb, 334-37.

Gaspard Monge and descriptive geometry, 338-44.

Remarks on some elementary volume relations between familiar solids, 417-19.

A scale for "scaleneness," 318-20.

The use of transformations in deriving equations of common geometric figures, 386-92.

The world of polyhedra, 244-48.

Vectors in algebra and geometry, 327-32.
GRAPHS AND GRAPHING

GRAPHS AND GRAPHING

A compass-ruler method for constructing ellipses on graph paper, 260-61.

A coordinate approach to the 25-point miniature geometry, 109-13.

Deductive proof of compass-ruler method for constructing ellipses, 261.

An exercise for the mathematics laboratory, 114-17.

The mathematics of the honeycomb, 334-37.

Reflexive, symmetric, and transitive properties of relations, 205-10.

Relations and functions, 251-57.

The use of transformations in deriving equations of common geometric figures, 386-92.

Using high school algebra and geometry in Doppler satellite tracking, 290-94.

GUIDANCE

Additions to an annotated bibliography for careers in mathematics, 517-18.

The missing half of our technical potential: Can we motivate the girls? 2-13.

Use of discriminant analysis for selecting students for ninth-grade algebra or general mathematics, 412-16.

HISTORY OF MATHEMATICS

Addition and subtraction on the soroban, 608-21.

Famous mathematicians

Angles, arcs, and Archimedes, 82-88.

Archimedes, 634-36.

Gaspard Monge and descriptive geometry, 338-44.

How Ptolemy constructed trigonometry tables, 141-49.

Adam Riese, 538-43.

Miscellaneous

Additions to an annotated bibliography for careers in mathematics, 517-18.

Applied mathematics in eleventh-century Iran: Abū Ja'far's determination of the solar parameters, 441-46.

Historically speaking,—, 33-36; 141-49; 244-50; 334-44; 441-47; 538-43; 630-

36; 720-23.

The history of the dodecahedron, 248-50. How far is it from here to there? 123-30. Johann Hudde and space coordinates, 33-36.

Recent evidences of primeval mathematics, 720-23.

The world of polyhedra, 244-48.

Topics in

Legibility of mathematical tables: the Babbage experiments of 1827, 446-47.

Mathematics in ancient Egypt: a checklist (1930-65), 630-34.

Problem solving in mathematics, II, 596-600.

HUMOR, SATIRE, POETRY

Collected mathematical poems, 536-37. The disconnection, 101.

Geometrics, 407.

I am mysterious, 432. My dearest Évariste, 332.

Some really new "new mathematics," 501.

Topology, 30.

Undefined terms, 315.

The unsung sum of things, 629.

Zero, 738.

Language of mathematics Dabar, logos, and shhhh, 24-25. Precision, accuracy, and other ambiguities, 509-11.

LIMITS

Continued square roots, 507-8.

LITERATURE

Miscellaneous

Additions to an annotated bibliography for careers in mathematics, 517-18.

Have you read? 31-32; 139-40; 437-40; 658-59; 737-38.

What's new? 13; 411; 654, 662; 741.

Reviews and evaluations, 156-59; 258-59; 353-61; 454-57; 655-57; 732-36.

Decimals and Percentage, Friel, 258.

Elementary Concepts of Modern Mathematics, Dinkiness, 734.

Enrichment Program for Junior High School, Marks, Smart, and Purdy, 454.

Finite Mathematical Structures, Yarnelle, 258-59.

First Course in Modern Algebra, Koo, Blyth, and Burchenal, 156.

Fundamental Concepts of Mathematics, Har-

mon and Dupree, 736.

Goals for School Mathematics: The Report of the Cambridge Conference on School Mathematics, 353-60.

Intermediate Algebra, Wooton and Drooyan, 156-57.

Introduction to Secondary Mathematics, Vol. I, Haag and Dudley, 734-35.

Introduction to Secondary Mathematics, Vol. II, Haag and Dudley, 735.

An Introduction to Transfinite Mathematics, Yarnelle, 258.

Modern Algebra—A Logical Approach, Pearson and Allen, 157-58.

Modern Elementary Mathematics, Ward and Hardgrove, 656-57.

Modern Intermediate Algebra, Nichols, Heimer, and Garland. 733-34.

A Modern Introduction to Basic Mathematics, Keedy, 732-33.

Modern Mathematics: Topics and Problems, Book 1, Aiken and Beseman, 158.

New Approaches to Mathematics Teaching, Land, 655.

New Curricula, A Report on the Methods and Programs for Teaching Science and the Humanities Which Promise to Revolutionize American Education, Heath, 158. A New Look at Arithmetic, Adler, 657.

The "New" Math for Teachers and Parents of Elementary School Children, Barker, Curran, and Metcalf, 454.

The New Mathematics (7 & 8), Weber and Weber, 732.

New Plane Geometry and Supplements, Hart, Schult, and Swain, 454-55.

One Hundred Problems in Elementary Mathematics, Steinhaus, 259.

Other Bases in Arithmetic, Marks, 158-59. Precalculus Mathematics, Meyer, 736.

Principles and Patterns of Numeration Systems, Archer, 259.

Second Course in Algebra, Weeks and Adkins, 360-61.

Seeing Through Mathematics, Book 3, Van

Engen, Hartung, Trimble, Berger, and Cleveland, 734.

Some Lessons in Mathematics, Association of Teachers of Mathematics, 361.

Subsets of the Plane: Plane Analytic Geometry, Taylor and Wade, 159.

Teaching Arithmetic in the Primary Grades, Hollister and Gunderson, 656.

Theory of Arithmetic, Peterson and Hashisaki, 455-56.

Topics in Mathematics, 29th Yearbook, National Council of Teachers of Mathematics, 655-56.

Updating Mathematics, Mueller, 456-57. Using Modern Mathematics, Urbancek and Urbancek, 457.

#### Logic

Complex contrapositives, 323-26.

An interim report on the national longitudinal study of mathematical abilities, 522-26. (See also Letter to the editor, 659.)

Methods and techniques of explaining new mathematical concepts in the lower forms of secondary schools, Part 1, 345 - 52.

Methods and techniques of explaining new mathematical concepts in the lower forms of secondary schools, Part 2, 448-53.

Project Idaho, 241-43.

The secondary teacher and elementary school mathematics, 313-15.

MATHEMATICS IN OTHER COUNTRIES

Applied mathematics in eleventh-century Iran: Abū Ja'far's determination of the solar parameters, 441-46.

A course in probability theory for second-

ary schools, 528-35.

The development of the teaching of mathematics in France at the first and second degree levels, 637-41.

The development of the teaching of mathematics in Soviet schools, 715-19.

International mathematical education, 37-44; 150-55; 251-57; 345-52; 448-53; 528-35; 637-41; 715-19.

Mathematics in ancient Egypt: a checklist

(1930-65), 630-34.

Methods and techniques of explaining new mathematical concepts in the lower forms of secondary schools, Part 1, 345-52.

Methods and techniques of explaining new mathematical concepts in the lower forms of secondary schools, Part 2, 448-53.

The new mathematics program in the Danish gymnasium, 150-55.

Reform of mathematics education around the world, 37-44.

Relations and functions, 251-57.

#### MEASUREMENT

How far is it from here to there? 123-30. A note on measurement, 431-32.

Precision, accuracy, and other ambiguities, 509-11.

#### NCTM

Bylaws

Articles of Incorporation, 664-65. Bylaws, 665-67.

Proposed amendments to bylaws with explanatory notes, 262-64.

Committee Reports

Annual Financial Report, 742-43.

The 1965-66 Budget, 550.

Report of the Nominating Committee, 50-59.

Meetings

Joint meeting—National Council of Teachers of Mathematics with the National Education Association, June 29, 1965,

NCTM-summer meeting, 428.

#### Minutes

Minutes of the Annual Business Meeting, 545-49.

Proceedings of the Sixteenth Annual Delegate Assembly, 739-41.

Miscellaneous

Federal funds for the improvement of mathematics education, 551-54.

Members and subscriptions, 663.

NCTM: Its growth and growing pains, 490 - 95.

NCTM Projects and Panels, Supplementary list, January, 1965, 362.

Registrations at NCTM conventions, 661 - 62.

Your professional dates, 59-60; 170-71; 264-65; 363-64; 474; 554-55; 668; 744.

NCTM Affiliated Group Officers and Editors, 160-70.

Committees and Representatives (1964-65), Supplementary list, 362-63. NCTM representatives, 461-66.

Numbers and number systems, theory A digital problem for 1965, 713-14.

Divisibility patterns in number bases, 308 - 10.

Divisibility test for 7, 429-30.

Divisibility tests of the noncongruence type, 709-12.

The end of a perfect number, 621-22.

Fermat's last theorem, 321-22.

Finding nonlinear factors of polynomials by modular methods, 502-6.

A general test for divisibility by any prime (except 2 and 5), 311-12.

Integers which are differences of squares, 26-27.

Introducing number theory in high school algebra and geometry, Part I: Algebra, 14 - 23.

Introducing number theory in high school algebra and geometry, Part II: Geometry, 89-101.

More on Pascal's Triangle and powers of 11, 425-28.

New domains, 514-17.

Of "prime" concern: What domain? 402-7. A portrait of  $\sqrt{2}$ , 586–95.

Problem solving in mathematics, II, 596-600.

A reachable research area, 420-21. Ten mathematical refreshments, 102-8. The ubiquitous number five, 511. Zero, 738.

OPINIONS AND PHILOSOPHIES

Opinions of college teachers of mathematics regarding content of the twelfth-year course in mathematics, 223-31.

A world of hope-helping slow learners enjoy mathematics, 118-22.

Points and viewpoints

Authors please note, 45-46.

Makers of a magazine, 730-31.

Points and viewpoints, 45-46; 521; 730-31. Transition and appreciation, 521.

PROBABILITY

Buffon's needle: stochastic determination of  $\pi$ , 601-7.

A course in probability theory for secondary schools, 528-35.

PROBLEM SOLVING

Buffon's needle: stochastic determination of  $\pi$ , 601-7.

A deceptively easy problem, 194-99.

An introduction to solving problems, 48-49. Problem solving in mathematics, I, 496-

Problem solving in mathematics, II, 596-600.

PSYCHOLOGY

Connectionism and the teaching machine, 200-204.

Mathematics for the noncollege-bound in junior high school, 232-40.

A world of hope-helping slow learners enjoy mathematics, 118-22.

RECREATIONAL MATHEMATICS

Grading Nomogram, 595.

A mathematical diversion, 527.

Ten mathematical refreshments, 102-8.

The ubiquitous number five, 511.

RESEARCH

Education

Educational research and the mathematics educator, 131-38.

Effectiveness of programmed teaching in college algebra, 434-36.

Experimental programs, 131-38; 434-36; 522-26; 642-48; 724-29.

Use of discriminant analysis for selecting students for ninth-grade algebra or general mathematics, 412-16.

What about modern programs in mathematics? 422-24.

Mathematics

An interim report on the national longitudinal study of mathematical abilities, 522-26. (See also Letter to the editor, 659.)

Textbook difficulty and mathematics achievement in junior high school, 724-

Miscellaneous

Experimental programs, 131-38; 434-36; 522-26; 642-48; 724-29.

SYMBOLISM

Dabar, logos, and shhhh, 24-25.

Definitions without exceptions, 221-22.

On the meaning of structure in mathematics, 226-31.

TEACHER

Education

Computers for school mathematics, 393-

The secondary teacher and elementary school mathematics, 313-15.

Project Idaho, 241-43.

TEACHING METHODS

Discovery

A reachable research area, 420-21.

Ten mathematical refreshments, 102-8. Expository

Definitions without exceptions, 221-22.

Methods and techniques of explaining new mathematical concepts in the lower forms of secondary schools, Part 1, 345-52.

Methods and techniques of explaining new mathematical concepts in the lower forms of secondary schools, Part 2, 448-53.

On the meaning of structure in mathematics, 226-31.

Miscellaneous

An exercise for the mathematics laboratory, 114-17.

Intersection and word union puzzles, 28-29. An introduction to solving problems, 48-49. Mathematics for the noncollege-bound in junior high school, 232-40.

Precision, accuracy, and other ambiguities, 509 - 11.

Tips for beginners, 47-49; 260-61; 458-60. A world of hope-helping slow learners enjoy mathematics, 118-22.

Programmed instruction

Connectionism and the teaching machine, 200 - 204.

Effectiveness of programmed teaching in college algebra, 434-36.

Retension as a function of paired and individual use of programmed instruction,

A technique for low achievers, 519-21.

The use and abuse of programed instruction, 705-8.

TEXTBOOKS

Aids for evaluators of mathematics textbooks, 467-73.

Adam Riese, 538-43.

Textbook difficulty and mathematics achievement in junior high school, 724-29.

TRIGONOMETRY

Applied mathematics in eleventh-century Iran: Abū Ja'far's determination of the solar parameters, 441-46.

How Ptolemy constructed trigonometry tables, 141-49.

The use of transformations in deriving

equations of common geometric figures, 386 - 92.

VISUAL AIDS

Addition and subtraction on the soroban, 608-21.

A Boolean switchboard, 211-20.

Connectionism and the teaching machine, 200-204.

An exercise for the mathematics laboratory, 114-17.

Motivating students with projects and teaching aids, 47-48.