

physical sciences, interpreting the phrase "physical sciences" in its largest sense. The prize will be awarded one year after the expiration of this interval. Neither resident nor non-resident national members of the Turin academy are eligible to the competition. No manuscripts will be received, nor will competing works be returned. The president of the academy is S. GIUSEPPE CARLE and S. A. NACGARI is secretary of the section of the physical sciences, mathematical and natural.

THE subject of Professor L. FUCHS's inaugural address as rector of the University of Berlin for the current year was "The reciprocal relations of pure science and technology."

LORD RAYLEIGH, professor of natural philosophy in the Royal Institution of Great Britain, received the Copley medal at the anniversary meeting of the London Royal Society this year for his investigations in mathematical and physical science.

MR. R. F. MUIRHEAD has been elected president of the Edinburgh mathematical society for the coming year.

DR. J. B. FAUGHT has been promoted from an instructorship to an assistant professorship at the University of Indiana.

DR. H. LIEBMANN has qualified as privat docent in mathematics at the University of Koenigsberg.

NEW PUBLICATIONS.

I. HIGHER MATHEMATICS.

ANDRÉEV (K. A.). *Elementary course in analytic geometry*. 2nd edition. (Russian.) Kharkov, 1896. R. 3.20

BIANCHI (L.). *Lezioni sulla teoria dei gruppi di sostituzioni e delle equazioni algebriche secondo Galois*. Pisa, 1899. 8°. 283 pp. Fr. 10.00

— . *Vorlesungen über Differentialgeometrie*. Autorisierte deutsche Uebersetzung von G. Lukat. 3te (Schluss-) Lieferung. Leipzig, Teubner, 1898. 8vo. Pp. 1-16 and 529-659. M. 4.00

BLUMENTHAL (O.). *Ueber die Entwicklung einer willkürlichen Funktion nach den Nennern des Kettenbruches für $\int_{-\infty}^0 \frac{\phi(\xi)d\xi}{z-\xi}$* . (Diss.) Göttingen, 1898. 8vo 57 pp.

BOBYNIN (V. V.). *The section of mathematics, astronomy and physics at the first nine meetings of the Association of Russian naturalists*

- and physicians; its objects and activity. Part I: The first, second, third and fourth meetings. (Russian.) Moscow, 1896. 8vo. 169 pp.
- BOUSSINESQ (J.). Infinitesimal analysis, translated by A. P. Nenachev. Vol. I: Differential calculus. Part I: Elementary part. (Russian.) Moscow, 1899. 8vo. 312 pp.
- BREMIKER (H.). Sur la transformation des courbes algébriques en général et sur celle des courbes du troisième ordre en particulier (d'après des cours de M. Weierstrass et de M. Bruns). (Progr.) Berlin, 1899. 4to. 19 pp.
- CAHEN (A.). Sur la formation explicite des équations différentielles du premier ordre dont l'intégrale générale est une fonction à un nombre fini de branches. (Thèse.) Paris, Gauthier-Villars, 1899. 4to. 99 pp.
- CAJORI (F.). Notes on the history of logarithms. (Sonderabdruck aus *Abhandlungen zur Geschichte der Mathematik*, IX, pp. 33-39.) Leipzig, Teubner, 1899. 8vo.
- CHEL PANOV (G.). The problem of space perception in its relation to the doctrine of a priori and innate ideas. Part I: The idea of space from the point of view of psychology. (Russian.) Kiev, 1896. 8vo. 15 + 387 pp. R. 2.50
- DE MORGAN (A.). Elementary illustrations of the differential and integral calculus. New edition. Chicago, The Open Court Publishing Co., 1899. 12mo. 8 + 144 pp. Cloth. \$1.00
- DOLBNA (I.). Memoir on the theory of Abelian integrals, presented to the Council of the Mining Institute. (Russian.) St. Petersburg, 1896. 8vo. 155 pp.
- ENCYKLOPÄDIE der mathematischen Wissenschaften mit Einschluss ihrer Anwendungen. Teil 1, Band I, Heft 4: F. W. Meyer, Invariantentheorie (Schluss); C. Runge, Gleichungen, Separation und Approximation der Wurzeln; K. T. Vahlen, Gleichungen, rationale Funktionen der Wurzeln, symmetrische und Affektfunktionen; O. Hölder, Gleichungen, Galois'sche Theorie mit Anwendungen. Leipzig, Teubner, 1899. 8vo. 353-512 pp. M. 4.50
- ERMAKOV (V. P.). Theory of Abelian functions. (Russian.) Kiev, 1897. 8vo. 120 pp.
- FILIPPOV (M. M.). Elementary theory of probabilities. (Russian.) St. Petersburg, 1896. R. 0.40
- FLEURY (H.). Théorie rationnelle de l'infini mathématique et du calcul infinitésimal. 2e édition, augmentée d'une théorie nouvelle du problème analytique des tangentes. Paris, 1899. 8vo. Fr. 10.00
- FRANKENBACH (F. W.). Die Anwendung trimetrischer Punktkoordinaten auf die merkwürdigen Punkte des Dreiecks. (Progr.) Liegnitz, 1899. 8vo. 39 pp.
- GERLACH (R.). Die Metrik in projektivischen Koordinaten. Zürich, 1899. 8vo. 112 pp. M. 5.00
- GLAGE (F.). Anwendung der Gruppentheorie auf die irreduzibeln Gleichungen vom sechsten Grade. (Diss.) Königsberg, 1899. 8vo. 96 pp.
- GOLDSCHIEDER (F.). Ueber die Gauss'sche Osterformel. Teil II. (Progr.). Berlin, 1899. 4to. 30 pp.

- GOTTSCHALK (A.). Beiträge zur konformen Abbildung Pascal'scher Schnecken. (Progr.) Burgsteinfurt, 1899. 4to. 16 pp., 1 plate.
- GRASSMANN (H.). Punktrechnung und projektive Geometrie. Teil III: Die linearen Verwandtschaften in der Ebene. Festschrift. Halle, 1898. 4to. 54 pp.
- GUNDERMANN (G.). Die Zahlzeichen. Giessen, 1899. 4to. 50 pp.
M. 2.00
- HAAS (A.). Lehrbuch der Integralrechnung. Teil II: Anwendung der bestimmten Integrale auf Quadratur, Rektifikation, Komplanation und Kubatur, sowie auf Aufgaben aus der Mechanik und Technik. Mit 246 vollständig gelösten Aufgaben, 163 Figuren und 137 Erklärungen, nebst ausführlichem Formelverzeichnis. Zum Selbststudium und zum Gebrauch an Lehranstalten bearbeitet. Stuttgart, Maier, 1899. 8vo. 8+284 pp. (Kleyers Encyklopädie der gesamten mathematischen, technischen und exakten Naturwissenschaften.)
M. 9.00
- HENSCHEL (A.). Untersuchungen über Berührungskugeln. (Progr.) Weimar, 1899. 4to. 16 pp.
M. 1.50
- HILL (H.). South African arithmetic. London, 1899. 8vo. Cloth. 4s.
- HOCHHEIM (E.). Ueber eine Art der Erzeugung der Kurven dritter Klasse mit einer Doppeltangente. (Diss.) Halle, 1899. 8vo. 50 pp.
- HÖLDER (O.). See ENCYKLOPÄDIE.
- JAHRBUCH über die Fortschritte der Mathematik, begründet von C. Ohrtmann. Unter besonderer Mitwirkung von F. Müller und A. Wangerin herausgegeben von E. Lampe. Vol. 28: 1897. Heft 2: Pp. 417-608. Berlin, Reimer, 1899. 8vo.
M. 6.00
- JUGA (G.). Die cyklischen Minimalflächen. (Diss.) Strassburg, 1898. 8vo. 39 pp.
- KAPLAN (I. T.). On the distribution in the natural series of the numbers prime to a given one. (Russian.) Odessa, 1897. 8vo. 56 pp.
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- LOVETT (E. O.). The theory of perturbations and Lie's theory of contact transformations. (Diss.) Leipzig, 1898. 8vo. 193 pp.
- LUKAT (M.). See BIANCHI (L.).
- MANSON (P.). Einleitung in die Theorie der Determinanten für Gymnasien und Realschulen. Aus der 3ten französischen Auflage übersetzt. Leipzig, Teubner, 1899. 8vo. 40 pp.
M. 1.00
- MEYER (F. W.). See ENCYKLOPÄDIE.
- MININ (A. P.). Collection of problems in the differential and integral calculus. (Russian.) St. Petersburg, 1899. 8vo. 78 pp.
M. 2.00
- MÖHRING (E.). Ueber die Abbildung der fünf platonischen Körper in centrierten Systemen sphärischer Flächen. (Diss.) Rostock, 1898. 8vo. 36 pp., 2 plates.
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NAU (F.). See SABOKT (S.).

NEKRASOV (P. A.). Application of algebra to geometry. 2d edition, with the addition of a chapter on a concrete interpretation of Lobachevsky's geometry. (Russian.) Moscow. 1896. 8vo. R. 1.50

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M. 1.50

PASCAL (E.). Repertorio di matematiche superiori (definizioni, formole, teoremi, cenni bibliografici). Vol. I.: Analisi. Milano, Hoepli, 1898. 16mo. 16 + 642 pp. (Manuali Hoepli.)
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PEIRCE (B. O.). A short table of integrals. Revised edition. Boston, Ginn & Company, 1899. 8vo. 134 pp.
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ROSSEVICH (I. N.). See SEBRET (J. A.).

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SABOKT (S.). Le traité sur l'astrolabe plan de Sévère Sabokt, écrit au VIII^e siècle, d'après des sources grecques, et publié pour la première fois, avec traduction française, par F. Nau. Paris, Leroux, 1899. 8vo. 116 pp. (Extrait du *Journal Asiatique*.)

SCARPIS (N.). Primi elementi della teoria dei numeri. Milano, Hoepli, 1897. 16mo. 8 + 152 pp. (Manuali Hoepli.)
Fr. 1.50

SCHILLING (F.). Ueber neue kinematische Modelle, sowie eine neue Einführung in die Theorie der cyklischen Kurven. Halle, Schilling, 1899. 8vo. 15 pp., 2 plates.
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- SCHULTZ (E.). Integrationsmöglichkeiten der Hamiltonschen partiellen Differentialgleichung mit drei Variablen. (Progr.) Stettin, 1898. 4to. 16 pp.
- SERRET (J. A.). Higher Algebra, translated by I. N. Rossevich. Part I: General properties and numerical solution of equations. Part II: Symmetric functions. Edited by M. O. Wolf. (Russian.) St. Petersburg, 1897. 8vo. 615 pp. R. 3.00
- SERVANT (M.). Essai sur les séries divergentes. (Thèse.) Paris, Gauthier-Villars, 1899. 4to. 65 pp.
- SHAPOSHNIKOV (N. A.). Attempt at a mathematical presentation of the ideas and results of ethics. (Russian.) Moscow, 1896. 8vo. 2 + 30 pp. R. 0.20
- SHIDLOVSKY (V.). On the doctrine of the differential and integral, (Russian.) St. Petersburg, 1896.
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- STINER (G.). Die dreimal berührenden Ellipsen der Steinerschen Hypocykloide. (Progr.) St. Gallen, 1899. 4to. 17 pp., 5 plates.
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- VALLÉE POUSSIN (CH. I. DE LA). Cours d'analyse infinitésimale. Ie et Iie parties. Paris, 1899. 4to. 2 + 212 + 222 pp. Fr. 19.00
- VAN VLECK (E. B.). On the determination of a series of Sturm's functions by the calculation of a single determinant. (*Annals of Mathematics*, 2nd series, Vol. I.) Salem, 1899. 4to. 13 pp.
- . On certain differential equations of the second order allied to Hermite's equation. (*American Journal of Mathematics*, Vol. 21, pp. 126-167.) 1899. 4to, 9 plates.
- VORONOI (G.). On a certain generalization of the algorithm of continued fractions. (Russian.) Warsaw, 1896. 8vo. 219 pp. R. 1.50
- WANGERIN (A.). See JAHRBUCH.
- WOLF (M. O.). See SERRET (J. A.).

II. ELEMENTARY MATHEMATICS.

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- BRIGGS (W.). Second stage mathematics. 2nd edition. London, Clive, 1899. 12mo. 474 pp. (Organized science series.) 3s. 6d.
- BUCHANAN (L. A.) and ANDRÉ (J. L.). The algebraic solution of equations of any degree; a novel, simple, and direct method for the solution of equations of the n th degree. San Francisco, Cal., published for the authors by The Whitaker & Ray Co., 1899. 12mo. 4 + 61 pp. Limp Cloth. \$0.80
- BUSCH (F.). Vorbereitender Lehrgang in der Körperlehre. (Progr.) Arnsberg, 1899. 4to. 20 pp.
- CASTLE (F.). Elementary practical mathematics. New York, The Macmillan Co., 1899. 16mo. 10 + 401 pp. Cloth. \$0.80
- CHAILAN (E.). Géométrie, à l'usage des élèves des classes de lettres, conforme au programme de la première partie du baccalauréat de l'enseignement secondaire classique. Paris, Poussielgue, 1899. 16mo. 8 + 240 pp. (Alliance des maisons d'éducation chrétienne.)
- DAVIDOV (A.). Geometry for grammar schools, based on Diesterweg. 11th edition. (Russian.) Moscow, Dymnov, 1897. 8vo. 63 pp. R. 0.35
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- EBERHARD. Ueber die im Pensum höherer Lehranstalten vorkommenden sogenannten imaginären Werte. (Progr.) Cassel, 1898. 4to. 58 pp., 1 plate.
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- MALININ (A.) and EGOROV (F.).** Geometry and collection of geometrical problems. Text-book for girls' schools and teachers' seminaries. 4th edition. (Russian.) Moscow, 1899. 8vo. 272 pp. R. 1.00
- MASING (K.) and KHAILOV (N.).** Systematic collection of algebraic problems. 3d edition. (Russian.) Moscow, 1897. 8vo. 339 pp. R. 1.25
- MATHEMATICS [for mechanics and engineers].** From *The Chicago Record*. New York, Doubleday & McClure Co., 1897-99. 12mo. 6 + 340 pp. Cloth. (Home study circle No. 2.) \$1.00
- MERCHINSKY (A.).** The analytical method of progressions. (Russian.) Moscow, 1896. 8vo. 16 pp.

MININ (A.). See ARBUZOV (V.).

MININ (V.). Collection of geometrical problems, with a collection of problems to be solved by the simultaneous application of geometry and trigonometry. 6th edition. (Russian.) Moscow, 1896.
R. 0.90

——. See ARBUZOV (V.).

MIRONOV (P.). Text-book of geometry, with the addition of: (1) questions for review, (2) geometrical exercises, and (3) developments of solids. 2d edition. (Russian.) Ufa, 1896. 8vo. Part I. 3 + 110 pp. Part II. 3 + 138 pp.
R. 0.80

——. Text-book of geometry. with collection of geometrical problems. (Russian.) Ufa, 1897. 8vo. Part III. 184 pp. Part IV. 118 pp.
R. 1.05

NAU (T.). Recueil de problèmes de trigonométrie rectiligne, renfermant en particulier 150 questions proposées aux baccalauréats depuis 1892. Première partie: Énoncés. Paris, Poussielgue, 1899. 8vo. 48 pp. (Alliance des maisons d'éducation chrétienne.)

NAZAROV (D.). See ARBUZOV (V.).

NEUMANN (C. E. O.). Formelbuch, enthaltend die hauptsächlichsten Formeln, Sätze und Regeln der Elementar-Mathematik, zum Gebrauche an Realschulen und Gymnasien übersichtlich zusammengestellt. 6te Auflage. Dresden, Axt, 1899. ‡ 16mo. 4 + 168 pp. Cloth.
M. 1.50

NIEWENGLOWSKI (B.) et GÉRARD (L.). Cours de géométrie élémentaire, à l'usage des classes de l'enseignement moderne. Géométrie dans l'espace. Paris, Carré et Naud, 1899. 8vo. 267 pp.

——. Cours de géométrie élémentaire, à l'usage des classes de lettres. Géométrie dans l'espace. Paris, Carré et Naud, 1899. 8vo. 126 pp.

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OSBORN (G.). See FRENCH (C. H.).

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- SASSO (M.). Formole dei quadrati e cubi dei polinomi; loro applicazioni per fare il quadrato e cubo dei numeri. Avellino, Pergola, 1899. 8vo. 22 pp. Fr. 1.00
- SCHARR (J.). Der erste geometrische Anschauungs-, Zeichen- und Rechenunterricht. Zum Gebrauche in einem Vorkursus des Geometrie-Unterrichts. Leipzig, Klinkhardt, 1899. 8vo. 4 + 64 pp., 4 plates. M. 0.60
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- SHAPOSHNIKOV (N. A.). Text-book of Algebra, adapted to the programmes of the secondary schools. 3d edition. (In 2 parts.) (Russian.) Part I: Course of the third and fourth classes of the gymnasia, with supplementary articles. Moscow, 1897. 8vo. 175 pp. R. 0.70
- Plane trigonometry, with a collection of trigonometrical problems. 7th edition. (Russian.) Moscow, 1899. 8vo. 136 pp. M. 2.70
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- SPITZ (C.). Lehrbuch der ebenen Geometrie, nebst einer Sammlung von 800 Übungsaufgaben, zum Gebrauch an höheren Lehranstalten und beim Selbststudium. 10te Auflage. Hierzu eine Beigabe: Erläuternde Tafeln mit erklärendem Text von K. Traub. Leipzig, Winter, 1899. 8vo. 12 + 294 + 32 pp., 25 plates. M. 4.50
- Die Resultate und Andeutungen zur Auflösung der in dem Lehrbuch [der ebenen Geometrie] befindlichen Aufgaben. 10te Auflage. Leipzig, Winter, 1899. 8vo. 4 + 113 pp. M. 1.60
- SYZRANSKY (P. I.). The solution of the quadrature of the circle with mathematical precision. (Russian.) Odessa, 1897. 8vo. 10 pp., 2 plates. R. 0.20

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- TRAUB (K.). See SPITZ (C.).
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