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1. **Database** ERIC
- Title** [1 or 0? Cantorian Conundrums in the Contemporary Classroom](#)
- Author** [Sriraman, Bharath](#); [Knott, Libby](#)
- Source** Australian Senior Mathematics Journal; v20 n2 p57-61 2006
- ISSN** 0819-4564
- Descriptors** [Mathematics Instruction](#); [Teaching Methods](#); [Mathematical Concepts](#); [Elementary Education](#); [Theories](#); [Preservice Teachers](#); [Logical Thinking](#); [Preservice Teacher Education](#); [Elementary School Mathematics](#)
- Abstract** In set theory, one comes across the notion of "vacuous truth." A statement is vacuously true if it is true but does not quite say anything. The structure of a vacuously true statement is typically of the form: everything with property A also has property B, with the caveat being that there is nothing in property A. For instance one could say: all humans with gills are sharks. This statement is vacuously true because there are no humans with gills. It is natural to dismiss such examples as absurd and pathologies within the framework of set theory. However the notion of vacuous truth arises in some pedagogical situations. The reader is undoubtedly curious whether a situation requiring the examination of "vacuous" truth can arise in a contemporary mathematics classroom. In fact such situations do arise. In this article, the author describes one such situation in a preservice elementary mathematics classroom. This unusual set-theoretic pedagogical situation is known as Cantorian conundrums. (Contains 1 footnote.)
- Availability** Australian Association of Mathematics Teachers (AAMT). GPO Box 1729, Adelaide, South Australia 5001. Tel: +61-8-8363-0288 ; Fax: +61-8-8362-9288; e-mail: office@aamt.edu.au; Web site: http://www.aamt.edu.au.
- Language** English
- Publication Year** 2006
- Publication Type** 080 Journal Articles; 141 Reports: Descriptive
- Accession Number** EJ744042
- Subfile** ERIC, Current Index to Journals in Education (CIJE)
- [View Record](#) | [Link to Article](#)
2. **Database** ERIC
- Title** [Are Giftedness and Creativity Synonyms in Mathematics?](#)
- Author** [Sriraman, Bharath](#)
- Source** Journal of Secondary Gifted Education; v17 n1 p20-36 Fall 2005
- ISSN** 1077-4610
- Descriptors** [Academically Gifted](#); [Creativity](#); [Mathematics](#); [Elementary Secondary Education](#); [Synthesis](#); [Comparative Analysis](#); [Models](#); [Mathematics Education](#); [Problem Solving](#)
- Abstract** At the K-12 level one assumes that mathematically gifted students identified by out-of-level testing are also creative in their work. In professional mathematics, "creative" mathematicians constitute a very small subset within the field. At this level, mathematical giftedness does not necessarily imply mathematical creativity but the converse is certainly true. In the domain of mathematics, are the words creativity and giftedness synonyms? In this article, the constructs of mathematical creativity and mathematical giftedness are developed via a synthesis and analysis of the general literature on creativity and giftedness. The notions of creativity and giftedness at the K-12 and professional levels are compared and contrasted to develop principles and models that theoretically "maximize" the compatibility of these constructs. The relevance of these models is discussed with practical considerations for the classroom. The paper also significantly extends ideas presented by Usiskin (2000). (Contains 2 figures and 5 endnotes.)
- Availability** Prufrock Press Inc. P.O. Box 8813, Waco, TX 76714-8813. Tel: 800-998-2208 ; Tel: 254-756-3337 ; e-mail: info@prufrock.com; Web site: http://www.prufrock.com.
- Language** English
- Publication Year** 2005
- Publication Type** 080 Journal Articles; 141 Reports: Descriptive
- Identifiers** No Child Left Behind Act 2001
- Accession Number** EJ746043
- Subfile** ERIC, Current Index to Journals in Education (CIJE)
- [View Record](#) | [Link to Article](#)
3. **Database** ERIC
- Title** [The Use of Fiction as a Didactic Tool to Examine Existential Problems](#)
- Author** [Sriraman, Bharath](#); [Adrian, Harry](#)
- Source** Journal of Secondary Gifted Education; v15 n3 p96-106 Spr 2004, 2005
- ISSN** 1077-4610
- Descriptors** [Critical Thinking](#); [Academically Gifted](#); [High School Seniors](#); [Secondary Education](#); [Fiction](#); [Consciousness Raising](#); [Teaching Methods](#); [Social Problems](#)

Abstract Recent geopolitical events have changed the naïve way in which many teenagers view the world. In particular, it has called into question many of the moral and ethical foundations we take for granted as norms of a functioning society. In the wake of these events, it is important for teachers to allow students, in particular the gifted, to voice their thoughts and critically examine issues pertinent to society and life. The study of literature through the prism of critical thinking can allow the student to experience its cohesiveness to life. Literature can be practical, inspirational, appealing, stimulating, and educational if approached with this purpose in mind. This paper describes how gifted high school seniors at a rural Midwestern public school discerned the nature of "truths" about society and life by critically examining a simple contemporary novel. Vignettes of student discussions that illustrate critical thinking and express "controversial" views are presented along with commentaries. It also offers discussion of the implications of using fiction as a didactic tool to examine existential problems in the high school classroom.

Language English

Publication Year 2005

Publication Type 080 Journal Articles; 141 Reports: Descriptive

Accession Number EJ682707

[View Record](#) | [Link to Article](#)

4. **Database** ERIC
- Title** [Combinatorial Mathematics: Research into Practice](#)
- Author** [Sriraman, Bharath](#); [English, Lyn D](#)
- Source** Mathematics Teacher; v98 n3 p182 Oct 2004
- ISSN** 0025-5769
- Descriptors** [Mathematics Instruction](#); [Mathematics Education](#); [Classroom Research](#); [Educational Research](#)
- Abstract** Implications and suggestions for using combinatorial mathematics in the classroom through a survey and synthesis of numerous research studies are presented. The implications revolve around five major themes that emerge from analysis of these studies.
- Availability** National Council of Teachers of Mathematics, 1906 Association Drive, Reston, VA 20191-1502. Web site: <http://www.nctm.org>.
- Language** English
- Publication Year** 2004
- Publication Type** 080 Journal Articles; 141 Reports: Descriptive
- Accession Number** EJ717734
- Subfile** ERIC, Current Index to Journals in Education (CIJE)
- [View Record](#) | [Link to Article](#)
5. **Database** ERIC
- Title** [Discovering Steiner Triple Systems through Problem Solving](#)
- Author** [Sriraman, Bharath](#)
- Source** Mathematics Teacher; v97 n5 p320-326 May 2004
- ISSN** 0025-5769
- Descriptors** [Grade 9](#); [Problem Solving](#); [Mathematics Instruction](#); [Teaching Methods](#); [Algebra](#)
- Abstract** An attempt to implement problem solving as a teacher of ninth grade algebra is described. The problems selected were not general ones, they involved combinations and represented various situations and were more complex which lead to the discovery of Steiner triple systems.
- Availability** National Council of Teachers of Mathematics, 1906 Association Drive, Reston, VA 20191-1502. Web site: <http://www.nctm.org>.
- Language** English
- Publication Year** 2004
- Publication Type** 052 Guides: Classroom: Teacher; 080 Journal Articles; 141 Reports: Descriptive
- Accession Number** EJ717699
- Subfile** ERIC, Current Index to Journals in Education (CIJE)
- [View Record](#) | [Link to Article](#)
6. **Database** ERIC
- Title** [Gifted Ninth Graders' Notions of Proof: Investigating Parallels in Approaches of Mathematically Gifted Students and Professional Mathematicians](#)
- Author** [Sriraman, Bharath](#)
- Source** Journal for the Education of the Gifted; v27 n4 p267-292 2004
- ISSN** 0162-3532
- Descriptors** [Grade 9](#); [Intuition](#); [Academically Gifted](#); [Geometry](#); [Mathematics Instruction](#); [Geometric Concepts](#); [Secondary School Mathematics](#); [Mathematics Skills](#); [Cognitive Processes](#)
- Abstract** High school students normally encounter the study and use of formal proof in the context of Euclidean geometry. Professional mathematicians typically use an informal trial-and-error approach to a problem, guided by intuition, to arrive at the truth of an idea. Formal proof is pursued only after mathematicians are intuitively convinced about the truth of an idea. Is the use of intuition to arrive at the plausibility of a mathematical truth unique to the professional mathematician? How do mathematically gifted students form the truth of an idea? In this study, 4 mathematically gifted freshmen with no prior exposure to proof nor high school geometry were given the task of establishing the truth or falsity of a nonroutine geometry problem, sometimes referred to as "circumscribing a triangle" problem. This problem asks whether it is true that for every triangle there is a circle that passes through each of the vertices. This paper describes and interprets the processes used by the mathematically gifted students to establish truth and compares these processes to those used by professional mathematicians. All 4 students were able to think flexibly, as evidenced in their ability to reverse the direction of a mental process and arrive at the correct conclusion. This paper further validates the use of Krutetskiian constructs of flexibility and reversibility of mental processes in gifted education as characteristics of the mathematically gifted student.
- Language** English
- Publication Year** 2004

Publication Type 080 Journal Articles; 143 Reports: Research
Accession Number EJ682719

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7. Database ERIC

Title [Mathematics and Literature \(the Sequel\): Imagination as a Pathway to Advanced Mathematical Ideas and Philosophy](#)

Author [Sriraman, Bharath](#)

Source Australian Mathematics Teacher; v60 n1 p17-23 2004

ISSN 0045-0685

Descriptors [Algebra](#); [Critical Thinking](#); [Learning Experience](#); [Geometry](#); [Teacher Student Relationship](#); [Class Activities](#); [Discussion \(Teaching Technique\)](#); [Teaching Methods](#); [Literature](#); [Mathematics Instruction](#); [Interdisciplinary Approach](#)

Abstract This article is the sequel to the use of "Flatland" with beginning algebra students reported in Sriraman (2003). The use of "Flatland" with beginning algebra students resulted in the positive outcomes of cultivating critical thinking in the students as well as providing the teacher with the context necessary to introduce sophisticated mathematical ideas. The marriage of mathematics and literature led students to reflect on contemporary society and its problems as well as gain an insight into notions of limits, historical approximation techniques and various non-Euclidean geometries (fractal geometry and Minkowskian space-time geometry). This atypical but refreshing learning experience led students to request the reading of one of the sequels to Flatland. The release of Stewart's "Flatterland" in 2001 provided an ideal follow up to "Flatland". Banchoff's (2001) review of "Flatterland" for the Mathematical Association of America partially found in the back cover states: "Flatterland" challenges readers to go beyond "Flatland" and deal with phenomena, not just in dimensions higher than four, but in many exotic geometric realms that stretch our imagination and powers of visualization." (Contains 1 figure and 1 table.)

Availability Australian Association of Mathematics Teachers (AAMT). GPO Box 1729, Adelaide, South Australia 5001. Tel: +61 8 8363 0288 ; Fax: +61 8 8362 9288; e-mail: office@aamt.edu.au; Web site: http://www.aamt.edu.au.

Language English

Publication Year 2004

Publication Type 080 Journal Articles; 141 Reports: Descriptive

Accession Number EJ743535

Subfile ERIC, Current Index to Journals in Education (CIJE)

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8. Database ERIC

Title [Mathematical Giftedness, Problem Solving, and the Ability To Formulate Generalizations: The Problem-Solving Experiences of Four Gifted Students.](#)

Author [Sriraman, Bharath](#)

Source Journal of Secondary Gifted Education; v14 n3 p151-65 Spr 2003

ISSN 1077-4610

Descriptors [*Ability Identification](#); [*Algebra](#); [*Generalization](#); [*Gifted](#); [*Mathematical Aptitude](#); [Mathematicians](#); [Mathematics Achievement](#); [Patterns in Mathematics](#); [Secondary Education](#); [Student Characteristics](#); [*Word Problems \(Mathematics\)](#)

Abstract Nine freshmen in a ninth-grade accelerated algebra class were asked to solve five nonroutine combinatorial problems. The four mathematically gifted students were successful in discovering and verbalizing the generality that characterized the solutions to the five problems, whereas the five nongifted students were unable to discover the hidden generality. (Contains references.) (Author/CR)

Other Numbers Clearinghouse: EC632288

Language English

Publication Year 2003

Publication Type 080 Journal Articles; 143 Reports: Research

Subfile ERIC, Current Index to Journals in Education (CIJE)

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