Darren B. Parker

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Education	Ph.D. in Mathematics, University of Wisconsin – Madison	*May 1998*

Area: Algebra   Minor: Mathematics Education
Advisor Donald S. Passman

	B.A. in Mathematics, Pomona College, Claremont, CA	*May 1992*

Other   Passed Actuarial Exam 1/P (Probability) with a score of 8.

Research   My areas of research include **Graph Theory, Hopf Algebras, Coalgebras**.

Grants   **Research Council SEED Grant Award**,
University of Dayton   *Summers 2002, 2003, 2004*

Professional Improvement Grant, Bemidji State University   *January 2001*

Experience   Department of Mathematics   *August 2015 – present*
Grand Valley State University

Associate Professor of Mathematics Courses taught are Trigonometry (MTH 123), Calculus 1 (MTH 201), Discrete Structures: Computer Science (MTH 225), and Modern Algebra (MTH 350).

Department of Mathematics   *August 2009 – May 2015*
Grand Valley State University

Assistant Professor of Mathematics Courses taught are Trigonometry (MTH 123), Calculus 1, 2, & 3 (MTH 201, 202, & 203), Communicating in Mathematics (MTH 210), Linear Algebra & Differential Equations (MTH 302), Modern Algebra (MTH 310), Discrete Mathematics (MTH 345), Advanced Calculus 1 (MTH 408), and Advanced Calculus 2 (MTH 409 as independent study).

Department of Mathematics   *August 2007 – May 2009*
Grand Valley State University

Visiting Assistant Professor of Mathematics Courses taught are College Algebra, Trigonometry, Calculus 1, 2, & 3, and Communicating in Mathematics.

Department of Mathematics   *August 2001 – May 2007*
University of Dayton

Assistant Professor of Mathematics Courses taught are Contemporary Mathematics (Liberal Arts course), Finite Mathematics, Business Calculus, Technical Mathematics, Mathematics for Elementary Teachers 1, Calculus 1, 2, & 3, Differential Equations, Linear Algebra, Abstract Algebra, Number Theory, and Topology.

Department of Mathematics/Computer Science   *August 1998 – May 2001*
Bemidji State University

Assistant Professor of Mathematics Courses taught are College Algebra, Algebra and Math Reasoning (a liberal arts course), Math for Elementary Teachers 2, first and second semester Calculus for business and biological science majors, Foundations and Discrete Mathematics (an introductory proof course), and Linear Algebra. I have also participated in the Summer Mathematics Institute, a summer workshop for elementary and middle school teachers funded by the Eisenhower foundation. Topics included geometry, data investigation, probability, and discrete math.

Publications

At GVSU   J. Jones, D.B. Parker, and V. Zadorozhnyy, *A Group Labeling Version of the Lights Out Game*, submitted to Involve.

D.B. Parker, *The Lights Out Game on Subdivided Caterpillars*, to appear in Ars Combinatoria.

C.A. Cusack, S.P. Edwards, and D.B. Parker, *Multidesigns of Complete Graphs for Graph-Triples of Order 6*, Journal of Combinatorial Mathematics and Combinatorial Computing **94** (2015), pp. 177–203.

D.B. Parker and R.F. Westhoff, *Convex Invariants in Multipartite Tournaments*, Australasian Journal of Combinatorics **54** (2012), pp. 19–35.

Previously   A. Giffen and D.B. Parker, *On Generalizing the "Lights Out" Game and a Generalization of Parity Domination*, Ars Combinatoria. **111** (2013), pp. 273–288.

D.B. Parker, R.F. Westhoff, and M.J. Wolf, *Two-Path Convexity and Bipartite Tournaments of Small Rank*, Ars Combinatoria **97** (2010), pp. 181–191.

D.B. Parker, R.F. Westhoff, and M.J. Wolf, *Convex Independence and the Structure of Clone-Free Multipartite Tournaments*, Discussiones Mathematicae Graph Theory **29** (2009), pp. 51–69.

D.B. Parker, R.F Westhoff, and M.J. Wolf, *On Two-Path Convexity in Multipartite Tournaments*, European Journal of Combinatorics **29** (2008), pp. 641–651.

A. Abueida, M. Daven, W.S. Diestelkamp, S.P. Edwards, and D.B. Parker, *Multidesigns for Graph-Triples of Order 6*, Congressus Numerantium **183** (2006), pp. 139–160.

D.B. Parker, R.F. Westhoff, and M.J. Wolf, *Two-Path Convexity in Clone-*

Free Regular Multipartite Tournaments, Australasian Journal of Combinatorics **36** (2006), pp. 177–196.

A. Abueida, W.S. Diestelkamp, S.P. Edwards, and D.B. Parker, *Determining Properties of a Multipartite Tournament from its Lattice of Convex Subsets*, Australasian J. Combinatorics, **31** (2005), pp. 217–230.

D.B. Parker, *On the Coradical Filtration of Pointed Coalgebras*, J. Algebra, **255** (2002), pp. 121–134.

D.B. Parker, $U(\mathfrak{g})$-*Galois Extensions*, Comm. Algebra, **29** (2001), pp. 2859–2870.

D.B. Parker, *Forms of Coalgebras and Hopf Algebras*, J. Algebra, **239** (2001), pp. 1–34.

In Progress	L. Keough and D.B. Parker, *An Extremal Problem on the Lights Out Game.*
	R. Hutchings, S. Napier, L. Renaud, and D.B. Parker, *The Lights Out Game on Complete Multipartite Graphs, Wheel Graphs, and Digraphs.*
Refereeing	Involve: July 2017
	American Mathematical Monthly: August 2013
	Discrete Applied Mathematics: May 2007
	Discrete Mathematics: January 2008, August 2009, June 2012.
	Australasian Journal of Combinatorics: July 2010
Talks	
GVSU	"An Extremal Problem on the Lights Out Game", Midwest Graph Theory Conference, Grand Valley State University, Allendale, MI October 2017
	"Yet Another Version of the Lights Out Game", Midwest Graph Theory Conference, Wright State University, Dayton, OH April 2016
	"The Lights Out Game on Subdivided Caterpillars", Midwest Graph Theory Conference, Indiana-Purdue University Fort Wayne, Fort Wayne, IN October 2014
	"Multidesigns for Graph-Triples of Order 6", Midwest Graph Theory Conference, Miami University, Oxford, OH April 2013
	"Graph Decompositions: The Jigsaw Puzzles of Graph Theory", Calvin College Colloquium, Grand Rapids, MI, November 2012; Hope College Colloquium, Holland, MI, October 2012
	"Multidecompositions: Taking a Graph Apart and Putting it Back Together", Mathematics Department Seminar, GVSU, Allendale, MI, September 2012
	"The Generalized Lights Out Game on Graphs", REU Seminar, Grand Valley State University, Allendale, MI, July 2011; Mathematics Colloquium, Hope College, Holland, MI, November 2011.

"Generalizing the 'Lights Out' Game", Midwest Graph Theory Conference, Indiana-Purdue University, Fort Wayne, IN April 2011.

"Convexity and Independence in Directed Graphs", Mathematics Department Seminar, GVSU, Allendale, MI, October 2010.

"Helly and Radon Independence Under 2-Path Convexity in Multipartite Tournaments", Midwest Graph Theory Conference, University of Detroit Mercy, Detroit, MI, April 2010.

"Some Families of Mathematical Games", Mathematics Colloquium, Hope College, Holland, MI, February 2010

"Mental Models in Mathematics Classes", Teaching Seminar, Grand Valley State University, Allendale, MI, October 2009

Previously   "A Mathematician Takes the Actuarial Exam", Mathematics Department Seminar, Grand Valley State University, Allendale, MI; Mathematics Colloquium, Hope College, Holland, MI, October 2008.

"On Generalizing the 'Lights Out' Game and a Generalization of Parity Domination", Invited Speaker, AMS Sectional Meeting, Special Session, Western Michigan University, Kalamazoo, MI October 2008.

"Some Mathematical Games", Mathematics Department Seminar, Grand Valley State University, Allendale, MI; Mathematics Colloquium, Hope College, Holland, MI, October 2007.

"Helly and Radon Independence in Clone-Free Multipartite Tournaments", Contributed Paper Session, Joint Mathematics Meetings, New Orleans, LA, January 2007.

"Convex Independence in Multipartite Tournaments", Discrete Mathematics Seminar, Wright State University, October 2006

"Group Theory and 'Lights Out' ", MAA Mathfest, Knoxville, TN, , August 2006.

"Multidesigns for Graph-Triples of Order 6", Southeastern International Conference on Combinatorics, Graph Theory, and Computing, Florida Atlantic University, Boca Raton, FL, March 2006.

"Cycles in Bipartite Tournaments", Contributed Paper Session, Joint Mathematics Meetings, San Antonio, TX, January 2006.

"Convex Invariants in Multipartite Tournaments", Midwest Graph Theory Conference, Middle Tennessee State University, Murfreesboro, TN September 2005.

"Cycles and Convexity in Bipartite Tournaments", University of Dayton Mathematics Colloquium, University of Dayton, September 2005.

"The Mathematics of Games", Invited Speaker, University of Dayton High School Mathematics Competition, University of Dayton, March 2005

"The Classical Convexity Numbers in Two-Path Convexity", Midwest Graph Theory Conference, Ball State University, Muncie, IN November 2004.

"Making Writing a Central Part of Mathematics Courses", Invited Speaker, Ohio Project NExT, John Carroll University, Cleveland, OH October 2004.

"Two-Path Convexity in Multipartite Tournaments", Midwest Graph Theory Conference, Western Kentucky University, Bowling Green, KY May 2004.

"Convexity in Graphs and Digraphs", Invited Speaker, Wright State University Mathematics & Statistics Colloquium, April 2004.

"Determining Properties of a Multipartite Tournament from its Lattice of Convex subsets", Invited Speaker, Joint Mathematics Meetings, Phoenix, AZ January 2004.

"Convexity in Multipartite Tournaments", Miami University Mathematics & Statistics Conference, Miami University, Oxford, OH October 2003.

"On Recovering a Multipartite Tournament from its Lattice of Convex Subsets", Midwest Graph Theory Conference, Valparaiso University, Valparaiso, IN September 2003.

"Convex Subset Lattices of Clone-Free Multipartite Tournaments", Midwest Graph Theory Conference, University of Wisconsin, Oshkosh, May 2003.

"The Breadth of Convex Subset Lattices of Clone-Free Multipartite Tournaments", Discrete Mathematics Seminar, Wright State University, May 2003.

"Some Upper Bounds on the Breadth of Convex Subset Lattices in Multipartite Tournaments", Invited Speaker, AMS Sectional Meeting, Indiana University, Bloomington, IN April 2003.

"On the Coradical Filtration of Pointed Coalgebras", Invited Speaker, AMS Sectional Meeting, University of Wisconsin, Madison, WI, October 2002.

"Convex Subsets of Multipartite Tournaments", Discrete Mathematics Seminar, Wright State University, October, 2002.

"On the Breadth of Lattices of Convex Subsets in Multipartite Tournaments", Midwest Graph Theory Conference, Illinois State University, Normal, IL, September 2002.

"On the Lattices of Convex Subsets in Multipartite Tournaments", Southeastern International Conference on Combinatorics, Graph Theory, and Computing, Florida Atlantic University, Boca Raton, FL, March 2002

"Group Learning in Mathematics", Teaching Seminar, University of Dayton, October 2001.

"Convex Subsets of Tournaments", Expository Seminar, University of Dayton, September, 2001.

"Mathematics as a Religion", Honors Council Lecture Series, Bemidji State University, March, 2001.

"Descent Theory for Coalgebras and Hopf Algebras", Expository Seminar, University of Dayton, February, 2001.

"Descent Theory for Duals of Inseparable Field Extensions", Contributed Paper Session, Joint Mathematics Meetings, New Orleans, LA, January, 2001.

"Mathematics and Storytelling", "Noon Meeting" Teaching Seminar, Bemidji State University, November, 2000.

"Using Mid-Term Evaluations as a Teaching Tool", "Noon Meeting" Teaching Seminar, Bemidji State University, April, 2000.

"Coalgebras, Hopf Algebras, and Descent Theory", Research Seminar, Bemidji State University, February, 1999 to April, 1999.

"Cooperative Learning in Calculus Courses", "Noon Meeting" Teaching Seminar, Bemidji State University, September, 1998.

"Tensor Products and Comultiplication in Vector Spaces", United States Air Force Academy, Colorado Springs, CO, March 1998.

"Forms of Hopf Algebras and $U(\mathfrak{g})$-Galois extensions," Contributed Paper Session, Joint Mathematics meetings, Baltimore, MD, January 1998.

"Forms of Coalgebras and Hopf Algebras," Invited speaker, AMS Sectional Meeting, Milwaukee, WI, October 1997.

Service

CLAS **CLAS Curriculum Committee:** Evaluate proposals from units in CLAS, including new courses, course changes, and changes to programs. Read rougly 6–11 proposals per week, make comments on a Blackboard Wiki to facilitate discussion, and meet weekly for two hours to discuss and vote on proposals. Fall 2012 to present. Chair from Fall 2016 to present.

Unit **Curriculum Task Force – Applied Mathematics Major:** This task force was created to construct an applied mathematics emphasis for the non-certification mathematics major. We looked at applied mathematics programs and documents from professional mathematics societies to guide us.

Student Success and Advising Task Force: This task force was created to help foster both the creation and implementation of ideas that can help our students achieve greater success in our classes, help our faculty more effectively advise students, and find ways to recruit students into our majors. In Fall 2014, I worked on a group responsible for writing profiles of alumni to help with recruitment. In Winter 2015, I worked with Dr. David Clark, along with students from the Statistics Department, to develop and administer a study to help the department understand how MTH 202 affects retention and recruitment of mathematics majors. In Fall 2015, I started looking at the data for any patterns that may be helpful. Fall 2014 to Fall 2016

Student Affairs Committee: Organize Alumni-in-Residence event, revise the advisee checklist, and award student memberships to professional mathematics societies. Fall 2012 to Winter 2015. Served as chair for 2013-2014 academic year.

Task Force for Math 201/210 Credit Swap: Support proposal for changing the number of credits for Math 201 and Math 210. Attended meetings and helped identify client disciplines that would be impacted by the change. December 2010 to May 2011.

Department Curriculum Committee: Determined course equivalencies for students transferring from another institution; facilitated the proposal for a new course (MTH 401); made corrections to curriculum guides for math majors; submitted several course proposals, including the Math 201/210 credit swap and changes to various course descriptions. Fall 2009 to Winter 2012 (chaired committee from Fall 2010 to Winter 2011) and Fall 2016 to present (chair from Fall 2017 to present).

Diversity Advisory Committee: Discussed issues related to diversity, including mentoring for women and junior faculty, diversity in faculty scholarship, and other issues. Fall 2009 to present.

GVSU Mathematical Problem Solving Club: Along with Clark Wells and others, provide activities, instruction, and collegiality for helping students pursue interesting mathematics problems and participate in mathematics competitions. Fall 2009 to Winter 2014.

Community   **National Science Foundation Review Panel:** Reviewed proposals for grants for the NSF program Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM). September 2010.   *Grand Valley State University*

Previously   **Putnam/GRE Study Session:** Ran study session for students competing in Putnam exam (Fall) and taking Mathematics GRE (Spring). Fall 2004 to Fall 2006 *University of Dayton*

Colloquium Committee: Maintained web pages, invited speakers, and took care of logistics for visiting speakers. Winter 2004 to Fall 2006   *University of Dayton*

Curriculum Committees: Helped to write department syllabi; helped to create a new discrete mathematics course for math majors and re-organize the probability/statistics sequence. Fall 2003 to Winter 2005   *University of Dayton*

Integration Bee: Devised and typed integrals for the competition, acted as official timekeeper, along with other miscellaneous tasks. Winter 2005 to Winter 2006 *University of Dayton*

Academic Senate: Participated in discussions about changes in general education and discipline-specific curricula. Fall 2006 to Winter 2007   *University of Dayton*

Calculus Textbook Selection Committee: Fall 2004   *University of Dayton*

Ohio Section MAA Committee: Committee on curriculum.   Fall 2006 to Winter 2007

Research Seminar Co-Organizer: Helped organize and gave talks in a seminar designed to increase faculty interest and participation in research activities. Fall 1999 to Fall 2000   *Bemidji State University*

Northern Minnesota Mathematics Contest Exam Co-Writer: Fall 1999
Bemidji State University

Conferences Midwest Graph Theory Conference, GVSU, October 2017

FTLC Fall Teaching Conference, GVSU, August 2016

Midwest Graph Theory Conference, Wright State University, April 2016

FTLC Fall Teaching Conference, GVSU, August 2015

Midwest Graph Theory Conference, Indiana-Purdue University Fort Wayne, October 2014

FTLC Fall Teaching Conference, GVSU, August 2014

FTLC Fall Teaching Conference, GVSU, August 2013

Midwest Graph Theory Conference, Miami University, April 2013

Joint Mathematics Meetings, San Diego, CA, January 2013

FTLC Fall Teaching Conference, GVSU, August 2012

Mathfest, Madison, WI, August 2012

Michigan Section of the MAA, Saginaw Valley State University, May 2012

FTLC Fall Teaching Conference, GVSU, August 2011

Michigan Section of the MAA, Western Michigan University, May 2011

Midwest Graph Theory Conference, Indiana-Purdue University at Fort Wayne, April 2011

FTLC Fall Teaching Conference, GVSU, August 2010

Mathfest, Pittsburgh, PA, August 2010

Michigan Section of the MAA, Eastern Michigan University, May 2010

Midwest Graph Theory Conference, University of Detroit Mercy, April 2010

FTLC Fall Teaching Conference, GVSU, August 2009

Michigan Section of the MAA, Central Michigan University, May 2009

AMS Central Sectional Meeting, Western Michigan University, October 2008

FTLC Fall Teaching Conference, GVSU, August 2008

Michigan Section of the MAA, Grand Valley State University, May 2008

Michigan Undergraduate Mathematics Conference, Michigan State University, October 2007

Midwest Graph Theory Conference, University of Detroit Mercy, October 2007

FTLC Fall Teaching Conference, GVSU, August 2007

Midwest Graph Theory Conference, Wright State University, May 2007

Joint Mathematics Meetings, January 2007

Midwest Graph Theory Conference, Indiana-Purdue University at Fort Wayne, November 2006

Mathfest, August 2006

Ohio Section of the MAA, Shawnee State University, April 2007

AMS Central Sectional Meeting, Miami University, March 2007

Southeastern International Conference on Combinatorics, Graph Theory, and Computing, Florida Atlantic University, March 2006

Joint Mathematics Meetings, January 2006

Undergraduate Mathematics Day, University of Dayton, November 2005

Ohio Section of the MAA, Muskingum College, October 2006

Ohio Section of the MAA, Ashland University, October 2005

Midwest Graph Theory Conference, Middle Tennessee State University, September 2005

Ohio Section of the MAA, Miami University, April 2005

Midwest Graph Theory Conference, Ball State University, November 2004.

Ohio Section of the MAA, John Carroll University, October 2004.

Midwest Graph Theory Conference, Western Kentucky University, May 2004

Joint Mathematics Meetings, January 2004.

Miami University Mathematics & Statistics Conference, Miami University, October 2003.

Midwest Graph Theory Conference, Valparaiso University, September 2003.

Midwest Graph Theory Conference, University of Wisconsin, Oshkosh, May 2003

AMS Central Sectional Meeting, Indiana University, April 2003

Ohio Section of the MAA, Kent State University, Trumbull, October 2002

AMS Central Sectional Meeting, University of Wisconsin, Madison, October 2002

Midwest Graph Theory Conference, Illinois State University, September 2002

Ohio Section of the MAA, Xavier University, April 2002

Southeastern International Conference on Combinatorics, Graph Theory, and Computing, Florida Atlantic University, March 2002

Ohio Section of the MAA, Marietta College, October 2001

North Central Section of the MAA, Bemidji State University, MN, October 2000

Wisconsin/Minnesota Project NExT workshop on the History of Mathematics, led by Dr. Fred Rickey, Menomonie, WI, September 2000

MAA North Central Section, Duluth, MN, April 2000

AMS Joint Mathematics Meetings, Washington, D.C., Jan 2000

Wisconsin/Minnesota Project NExT workshop on Research in Mathematics Education, led by Dr. Ed Dubinsky, Menomonie, WI, October 1999

MAA North Central Section, University of Minnesota, Morris, MN, October 1999

MAA North Central Section, Carleton College, Northfield, MN, April 1999

AMS Joint Mathematics Meetings, San Antonio, TX, January 1999

MAA North Central Section, Concordia College, Moorhead, MN, Ocober 1998

AMS Joint Mathematics Meetings, Baltimore, MD, January 1998

AMS Fall Central Sectional Meeting, Milwaukee, WI, October 1997

AMS Joint Mathematics Meetings, San Diego, CA, January 1997