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# Lee Roberson

# Curriculum Vitae

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Department of Mathematics  
University of Colorado  
Campus Box 395  
Boulder, CO 80309

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## Education

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Ph.D. in Mathematics Education, University of Northern Colorado 2014  
Advisor: Bill Blubaugh  
Dissertation: *Building bridges: Connecting collegiate athletic and mathematics cultures.*

M.A. in Mathematics, University of Kentucky 2007  
Advisor: Edgar Enochs

B.S. in Mathematics, University of Kentucky 2005

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## Current Position

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Associate Teaching Professor of Mathematics, University of Colorado-Boulder 2016-present

Department of Mathematics

MATH 1300, Calculus 1 Course Coordinator (Spring 2017, Fall 2017, Fall 2018, Spring 2019)

MATH 2300, Calculus 2 Course Coordinator (Fall 2016, Spring 2018, Fall 2020, Spring 2021, Fall 2021, Spring 2022)

MATH 2400, Calculus 3 Course Coordinator (Fall 2023, Spring 2024, Fall 2024)

Instructor of Record

- MATH 1112, Business Analysis
  - MATH 1150, Precalculus
  - MATH 1300, Calculus 1
  - MATH 2001, Discrete Mathematics
  - MATH 2300, Calculus 2
  - MATH 2400, Calculus 3
  - MATH 3120, Functions and Modeling
  - MATH 3210, Euclidean and Non-Euclidean Geometry
  - MATH 3850, Seminar in Guided Mathematics Instruction
  - MATH 5905, Mathematics Teacher Training
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## Research Interests

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- Developing understanding of the culture of mathematics, and then taking this understanding to inform teaching practices that help share the culture of mathematics and bring students deeper into the culture of mathematics.
- Designing and implementing inquiry-based pedagogical practices within a mathematics classroom
- Examining graduate teaching assistants' questioning techniques

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## Curriculum Development

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| Reform of MATH 2400 - Calculus 3 Curriculum Materials at University of Colorado-Boulder   | 2023-present |
| <ul style="list-style-type: none"><li>• Development of course learning objectives</li><li>• Development of visualization tools resources for course</li><li>• Revision of online homework problem sets</li><li>• Creation of novel written homework assessments focusing on students' conceptual understanding and metacognition skill</li></ul>  |              |
| Development of MATH 127 – Precalculus Course at Colorado State University   | 2022         |
| <ul style="list-style-type: none"><li>• Incorporated Pathways to Calculus curriculum</li><li>• Development of course schedule</li><li>• Trained instructors, graduate students, and learning assistants to implement curriculum in class</li><li>• Informed advising of course content and policies</li><li>• Created and managed learning assistants and tutors for College Algebra and Precalculus Support Center</li></ul> |              |
| Development of MATH 120 – College Algebra Course at Colorado State University   | 2023         |
| <ul style="list-style-type: none"><li>• Incorporated Pathways to Calculus curriculum</li><li>• Development of course schedule</li><li>• Trained instructors, graduate students, and learning assistants to implement curriculum in class</li><li>• Informed advising of course content and policies</li><li>• Created and managed learning assistants and tutors for College Algebra and Precalculus Support Center</li></ul> |              |
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VCAST Modules Asynchronous Materials Development for Instructors	2022
<ul style="list-style-type: none"> <li>• NSF funded project (1726543)</li> <li>• Assist with design plans for asynchronous onboarding of all new and existing VCAST partners to the new VCAST App being hosted via Moodle</li> <li>• Troubleshoot and edit materials on the Moodle platform</li> </ul>	
Revision of MATH 2300 - Calculus 2 Curriculum at University of Colorado-Boulder	2019-2020
<ul style="list-style-type: none"> <li>• Development of course learning objectives</li> <li>• Redesign of curriculum to accommodate for remote environment</li> <li>• Revised course schedule</li> <li>• Development of active learning projects and activities</li> <li>• Creation of novel written homework assessments focusing on students' conceptual understanding and metacognition skills</li> </ul>	
Incorporating and Refining of Video Case Analysis of Student Thinking (VCAST) Modules into MATH 3120 - Functions and Modeling at University of Colorado-Boulder	2019-2021
<ul style="list-style-type: none"> <li>• NSF funded project (1726543)</li> <li>• Implementing and offering feedback on materials that invite students to solve challenging mathematical tasks, watch videos and examine written work of secondary students solving the same tasks, describe secondary students' reasoning, and evaluate and predict students' problem-solving processes</li> <li>• Redesign of materials to accommodate for remote environment</li> </ul>	
Revision of MATH 1300 - Calculus 1 Course Materials at University of Colorado-Boulder	2018-2019
<ul style="list-style-type: none"> <li>• Development of course learning objectives</li> <li>• Development of active learning projects and activities</li> <li>• Development of instructor notes for implementing active learning projects</li> <li>• Creation of novel written homework assessments focusing on students' conceptual understanding and metacognition skills</li> </ul>	
Revision of MATH 2400 – Calculus 3 Curriculum at University of Colorado-Boulder	2016
<ul style="list-style-type: none"> <li>• Redesign of curriculum to accommodate transition from 4 to 5 credit hours</li> <li>• Revised course schedule</li> <li>• Development of active learning projects and activities</li> <li>• Development of instructor notes for implementing active learning projects and activities</li> </ul>	

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## Professional Teaching Experience

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Assistant Teaching Professor of Mathematics, Colorado State University 2022-2023  
Department of Mathematics  
MATH 127, Precalculus Course Coordinator (Fall 2022)  
MATH 120, College Algebra Course Coordinator (Spring 2023)

Instructor of Mathematics, Laramie County Community College 2013-2016  
School of Mathematics and Science  
Instructor of Record

- MATH 2800, Mathematics Major Seminar
- MATH 2210, Calculus III
- MATH 2205 Calculus II
- MATH 2200 Calculus I
- MATH 2120, Geometry & Measurement for Elementary Teachers
- MATH 1105, Data, Probability & Algebra for Elementary Teachers
- MATH 1100, Numbers & Operations for Elementary Teachers
- MATH 1000, Problem Solving
- MATH 930, Intermediate Algebra
- MATH 920, Elementary Algebra
- MATH 900, Pre-Algebra
- EDEL 2410, Elementary School Mathematics Seminar II
- EDEL 1410, Elementary School Mathematics Seminar I

Graduate Teaching Assistant in Mathematics, Univ. of Northern Colorado 2008-2013  
School of Mathematical Sciences  
Instructor of Record (through Spring 2013):

- MATH 341, Modern Geometry
- MATH 233, Calculus III
- MATH 182, Fundamentals of Mathematics II: Algebra, Probability, & Data Analysis
- MATH 181, Fundamentals of Mathematics I: Numbers & Operations
- MATH 176, Topics in Calculus
- MATH 124, College Algebra

Assisted with Classes (through Spring 2013)

- MATH 528, Discrete Mathematics
- MATH 342, Modern Geometry II

Graduate Teaching Assistant in Mathematics, University of Kentucky Instructor of Record:	2005-2007
<ul style="list-style-type: none"> <li>• College Algebra</li> <li>• Intermediate Algebra</li> <li>• Calculus III (recitation)</li> <li>• Calculus I (recitation)</li> </ul>	
Undergraduate Teaching Assisting in Mathematics, University of Kentucky	2003-2005
Classes Assisted With:	
<ul style="list-style-type: none"> <li>• Calculus II</li> <li>• Elementary Calculus</li> <li>• Analytical Geometry</li> </ul>	

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## Related Experience

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Mentorship in Inquiry-Based Instruction Under direction of N. Miller (Educational Advancement Foundation funded)	2011-2012
<ul style="list-style-type: none"> <li>• Observe and assist N. Miller inquiry-based teaching practices</li> <li>• Implement inquiry-based practices in my own instruction</li> </ul>	
Summer Graduate Research Assistant, University of Northern Colorado Under direction of H. Soto-Johnson and M. Oehrtman	2011
<ul style="list-style-type: none"> <li>• Qualitative data analysis of interview data</li> <li>• Present preliminary findings at Mathfest 2011</li> </ul>	
Graduate Research Assistant Mathematics Teacher Leadership Center (NSF-funded)	2010-2011
<ul style="list-style-type: none"> <li>• Compile methods and initial findings of research</li> <li>• Initial qualitative analysis of on-line classroom data</li> </ul>	
Summer Graduate Research Assistant Mathematics Teacher Leadership Center (NSF-funded)	2010
<ul style="list-style-type: none"> <li>• Quantitative analysis of interview and observation data</li> </ul>	
Summer Graduate Research Assistant Mathematics Teacher Leadership Center (NSF-funded)	2009
<ul style="list-style-type: none"> <li>• Analysis of survey data</li> <li>• Produce a written synthesis of analysis of survey data</li> </ul>	
Explorer Program, University of Kentucky Appalachian Mathematics and Science Partnership (NSF-funded)	2003-2005
<ul style="list-style-type: none"> <li>• Assist professors in their teaching</li> <li>• Hold regular hours in study room for math students</li> <li>• Meet with mathematics faculty to discuss teaching mathematics</li> </ul>	

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- Private mathematics and statistics tutor for student-athletes

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## Peer-Reviewed Publications

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Roberson, L., Hopkins, T., Cavie, L., DuCloux, K., Magiera, M., & Naresh, N. (under review) *The importance of reflection for mathematics teacher educations' growth and development.*

Naresh, N., DuCloux, K., Hopkins, T., Cavey, L., Magiera, M., Roberson, L., & Totorica, T. (in press) The story of VCAST-SIG: Collaborative approaches that enhance MTE professional knowledge and teacher learning. [Paper presentation]. PMENA, Reno, NV, United States

Roach, K., Roberson, L., Tsay, J.-J., & Hauk, S. (2013) *College mathematics and question strategies.* In: Hauk, S., Speer, N.M., Kung, D., Tsay, J.-J., & Hsu, E. (Eds) *Video cases for college mathematics instructor professional development.* Retrieved from <http://collegemathvideocases.org/essays/index.php>

Soto-Johnson, H., Oehrtman, M., Noblet, K., Roberson, L., & Rozner, S. (2012). Experts' reification of complex variables concepts: The role of metaphor. *Proceedings of the 15th Annual Conference on Research in Undergraduate Mathematics Education*, pp. 433-447. Retrieved from [http://pzacad.pitzer.edu/~sbrown/RUME/RUME\\_XV\\_Volume\\_1.pdf](http://pzacad.pitzer.edu/~sbrown/RUME/RUME_XV_Volume_1.pdf)

Roach, K., Roberson, L., Tsay, J.J., & Hauk, S. (2010) *Mathematics graduate teaching assistants' question strategies.* Paper presented at Thirteenth SIGMAA on Research in Undergraduate Mathematics Education Conference, Raleigh, NC.

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## Selected Presentations

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Round Table Presenter – Inquiry-Based Learning  
Discipline Based Education Research Group, Boulder, CO

Dec, 2024

Creating Assessments that Promote Meaningful Learning within the  
Calculus Sequence  
Presentation  
MAA MathFest 2024, Indianapolis, IN

August, 2024

Professional Development of Mathematics Teacher Educators – Insights  
from Research  
Presentation with N. Naresh, K. DuCloux, M. Magiera, L. Cavey, &  
T. Hopkins  
15<sup>th</sup> International Congress on Mathematics Education, ICC  
Sydney, Australia

July, 2024

Creating Homework that Promotes Meaningful Learning  
Presentation with J. Gensler  
Seminar in Undergraduate Mathematics Education, Boulder, CO

Feb, 2024

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Professional Development of Mathematics Teacher Educators: Insights from Research Presentation with N. Naresh, K. DuCloux, M. Magiera, L. Cavey, & T. Hopkins 2024 Association of Mathematics Teacher Educators Orlando, FL	Feb, 2024
Research Panel Discussion University of Colorado-Boulder Math Community of Support for Marginalized Students (COSMOS) Boulder, CO	Dec, 2023
Incorporating Inquiry-Based Learning in Large Coordinated Courses: Challenges, Ideas, and Conversation Presentation MAA MathFest 2023, Tampa, FL	August, 2023
A Brief Introduction to the World of Inquiry-Based Learning Presentation with M. Henriksen, J. Barrera, & M. Wentworth MAA MathFest 2023, Tampa, FL	August, 2023
How Do We Learn to Think Mathematically Presentation University of Colorado-Boulder Math Club Talk Boulder, CO	March, 2022
Stories from the Field: Mathematics Teacher Educator Learning via Implementation of a Video-Based Intervention Presentation with L.O. Cavey, T. Totorica, K. DuCloux, R. Gine, N. Gertenschlager, T.M. Hopkins, M. Magiera, & N. Naresh 2022 Association of Mathematics Teacher Educators Henderson, NV	Feb, 2022
Introduction to Mastery Grading Presentation University of Colorado-Boulder MATH 5905 – Mathematics Teacher Training Seminar Course Talk Boulder, CO	April, 2021
Designing and Implementing Active Learning Reform for Calculus 3 Presentation with F.T.Liu & C. Ng National Inquiry-Based Learning and Teaching Conference Denver, CO	June, 2019
Defining Definitions Presentation University of Colorado-Boulder Math Club Talk Boulder, CO	Nov, 2018

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Incorporating Active Learning Strategies Through a Problem Based Calculus Course Presentation Wyoming Mathematical Association of Two-Year Colleges Annual Articulation Conference, Torrington, WY.	April, 2016
Panel Discussion on a Mentoring Program for Using IBL Methods in Teaching College Geometry Presentation with N. Miller, S. Rozner Haley, & B.A. Dibbs 17 <sup>th</sup> Annual Legacy of R.L. Moore – Inquiry-Based Learning Conference, Denver, CO.	June, 2014
Sharing Our Mathematics Culture Research Presentation Mathematical Association of America Rocky Mountain Section Meeting, Laramie, WY.	March, 2014
Geometric Interpretations of Complex Variables and Complex-Valued Functions Research Presentation with H. Soto-Johnson, S. Rozner, K. Noblet, & M. Oehrtman MathFest, Lexington, KY.	Aug, 2011
An Inquiry into the Influences of Pedagogical Content Knowledge and Epistemological Stance on Teachers' Approach to Teaching Fundamental Theorem of Calculus Research Presentation with V. Blasjo & T. Dalgamoni UNC Research Day, University of Northern Colorado	April, 2010
Why Did I Ask That? The Questions Graduate Teaching Assistants Ask Their Students Research Presentations with K. Roach & K. Noblet UNC Research Day, University of Northern Colorado	April, 2009

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### **Workshops and Minicourses attended**

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Building Thinking Classrooms, SIGMAA IBL Workshop Series	2024
Inquiry on Inquiry: Questions for Formative Assessment, SIGMAA IBL Workshop Series	2024
Video Cases of Student Reasoning for Inquiry-Based Learning about Functions, SIGMAA IBL Workshop Series	2024
Using AI and Ungrading in Teaching Mathematics with Inquiry, SIGMAA IBL Workshop Series	2024
Weaving Students in Versus Weeding Them Out: Research-Based Strategies that Support Equity in the IBL Classroom, SIGMAA IBL Workshop Series	2024
A Taste of IBL (inquiry-Based Learning), SIGMAA IBL Workshop Series	2024



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Responding to Students' "Mistakes:" an Anti-Deficit Perspective with IBL, SIGMAA IBL Workshop Series	2023
Imbuing Inquiry-Based Instruction with Equity: The Importance of Social Marker Data, SIGMAA IBL Workshop Series	2023
Behind the Scenes: Fostering Effective Thinking Through IBL (Tough) Love, SIGMAA IBL Workshop Series	2023
Playing Math: Transferring Authority to Students, SIGMAA IBL Workshop Series	2023
Group Work, Equity, and Student Buy-In, SIGMAA IBL Workshop Series	2022
Incorporating Cognitive Psychology Based Strategies for Math Instruction, SIGMAA IBL Workshop Series	2022
Using Inquiry to Teach Mathematics and Thinking, SIGMAA IBL Workshop Series	2022
Online Activities for In-person or Remote Multivariable Calculus Courses, SIGMAA IBL Fall Workshop Series	2022
Writing Materials for Learning with Inquiry, SIGMAA IBL Workshop Series	2022
Implementing Pathways to Calculus, Curriculum Workshop	2022
Back to the Future: Teaching with Inquiry During and Beyond the Pandemic, SIGMAA IBL Workshop Series	2022
Connecting Teaching and Learning: Using Student Thinking as the Bridge, SIGMAA IBL Workshop Series	2022
The Active Learning Pedagogy Sequence (the ALPS): A Model for Expanding the Use of Active Learning Structures in the College Mathematics Classroom, SIGMAA IBL Workshop Series	2021
Video Lesson Study of Inquiry in Action, SIGMAA IBL Workshop Series	2021
Tilting the Classroom: Experiences of Engaging Students in Large Classes in the UK, SIGMAA IBL Workshop Series	2021
Inquiry-Based Learning Mathematics and Beyond, SIGMAA IBL Workshop Series	2021
Listening to Our Own Advice, SIGMAA IBL Workshop Series	2020

Arts & Science Support of Education Through Technology (ASSETT) Summer Course Design Workshop, University of Colorado- Boulder	2020 2020
Mastery Grading Virtual Conference	2019
VCAST UTeach Virtual Workshop	2019
VCAST UTeach Workshop Austin, TX	2017
Arts & Science Support of Education Through Technology (ASSETT) Faculty Fellowship, University of Colorado-Boulder	2016
College Mathematics Instructor Development Source Workshop Orono, ME	2016
Inquiry-Based Learning Workshop Academy of Inquiry Based Learning, Boulder, CO	2016
Designing and Implementing a Problem Based Mathematics Course MAA Minicourse Joint Mathematics Meetings, Seattle, WA	2016
Increasing Student Engagement and Understanding through Active Learning Strategies in Calculus MAA Minicourse Joint Mathematics Meetings, Seattle, WA	

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## **Service**

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Mentoring junior teaching faculty member	2024-present
Mathematics Association of America – Rocky Mountain Section Meeting, Co-Organizer	2024-present
Mathematics Association of America - Rocky Mountain Section, Executive Committee	2024-present
Math Instruction, Working Group on Pedagogy, University of Colorado- Boulder	2024-present
Faculty adviser for Community of Support for Marginalized Students (COSMOS) Math student organization, University of Colorado- Boulder	2024-present
Undergraduate Committee Member, Mathematics department, University of Colorado-Boulder	2023-present
Organizer for SIGMAA IBL Remote Speaker Workshop Series	2021-present
Program Coordinator, SIGMAA IBL	2021-present

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Review manuscript for PRIMUS	2024
Review article for the American Mathematical Monthly	2024
Hire and Manage Tutors and Learning Assistants for College Algebra and Precalculus Support Center, Mathematics department, Colorado State University	2022-2023
Ad-hoc Committee for Teaching Professor Promotion, University of Colorado-Boulder	2022
Observation of Lecturers, Mathematics department, University of Colorado-Boulder	2021-2022
Member of Diamond Peaks Ski Patrol, volunteer backcountry ski patrol for Cameron Pass, CO	2021-present
Initiated and Co-organizer for Seminar in Undergraduate Mathematics Education, Mathematics department, University of Colorado-Boulder	2021
Undergraduate Committee Member, Mathematics department, University of Colorado-Boulder	2020-2022
Maintaining Active Learning Materials for Calculus Website for University of Colorado-Boulder	2020-2022
Moderator for SIGMAA IBL Contributed Paper Session, MathFest 2021 Virtual Conference	2024, 2023, 2021
Initiated Calculus Faculty Learning Committee with Joseph Timmer, University of Colorado-Boulder	2019-2020
Observation of Lecturers, Mathematics department, University of Colorado-Boulder	2019-2020
Undergraduate Committee Member, Mathematics department, University of Colorado-Boulder	2019-2020
Coordination Committee Member, Mathematics department, University of Colorado-Boulder	2017-2018
Undergraduate Committee Member, Mathematics department, University of Colorado-Boulder	2017-2018
Outreach Committee Member, Mathematics department, University of Colorado-Boulder	2016-2022
Observation of Graduate Teaching Assistants' teaching and follow-up debrief, Mathematics department, University of Colorado-Boulder	2016-2022

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Assist in Learning Assistant Interviews, Mathematics department, University of Colorado-Boulder	2015-2016
School of Math and Science Faculty Senate Representative, Laramie County Community College	2015
Mathematics Department Institutional Assessment Goals Committee, Laramie County Community College	2014-2015
Advising Committee for Developmental Mathematics Curriculum Reform, Laramie County Community College	2013-2014
Mathematics Faculty Representative, Laramie County Community College, Search committee for mathematics faculty position	2013-2014
Host Committee Member, University of Northern Colorado, Research in Undergraduate Mathematics Education Conference	2012-2013
Graduate Mathematics Student Representative, University of Northern Colorado, Search committee for a tenure-track mathematics position	2012
Freshmen Summer Advising, University of Northern Colorado	2011
Conference Proceedings Reviewer, Research in Undergraduate Mathematics Education	2011
Mathematics Tutor, University of Northern Colorado	2008-2012

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## **Recognition**

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Arts & Science Support of Education Through Technology (ASSETT) Faculty Fellow, University of Colorado-Boulder	2019-2020
Nominee for CU Boulder Libraries' and Student Government Open Educator Award, University of Colorado-Boulder	2019
Nominee for Marinus Smith Award, University of Colorado-Boulder	2019
Nominee for Speaker at 8 <sup>th</sup> Annual Student Research Celebration Banquet, University of Northern Colorado	2013
Award for Outstanding Teaching by a Graduate Student, University of Northern Colorado	2011
Nominee for Outstanding Teaching by a Graduate Student, University of Northern Colorado	2010
Dean's Scholarship, University of Northern Colorado	2008

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## **Professional Skills**

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Qualitative Research and Statistics

Proficient in NVivo and SPSS

Teaching and Learning

Proficient in Microsoft Office, GeoGebra, Spherical Easel, nonEuclid: Interactive Constructions in Hyperbolic Geometry, TI calculators, Blackboard, WebWork, Elluminate Live!, Desire2Learn, Tegrity Recordings, ALEKS, MyMathLab, WebAssign, Mathematica, LaTeX, Canvas, Slack, Zoom, Kaltura, Desmos, and Excel, Google Jamboard, Microsoft OneNote, Moodle, iMathAS

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