IBL Texts in Geometry and Analysis for Future Teachers

David M. Clark
SUNY, New Paltz

August 3, 2023

— Tampa MathFest —

High school mathematics consists primarily of

1. Euclidean geometry
2. algebra, trigonometry, precalculus, calculus

High school mathematics consists primarily of

1. Euclidean geometry
2. algebra, trigonometry, precalculus, calculus

Future teachers generally take courses:

1. Geometry
2. Real Analysis 1 and 2

High school mathematics consists primarily of

1. Euclidean geometry
2. algebra, trigonometry, precalculus, calculus

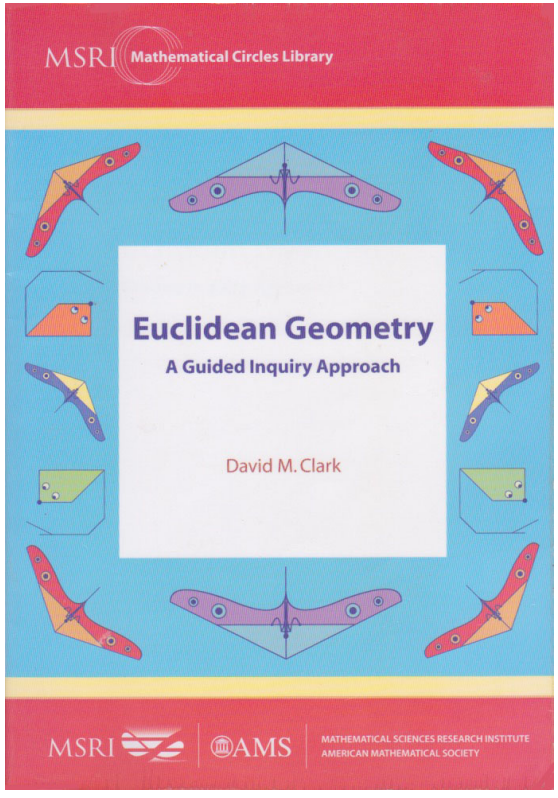
Future teachers generally take courses:

1. Geometry
2. Real Analysis 1 and 2

Goal:
Design inquiry-based courses for future teachers focused on only the topics they will later teach.

2005 - 2012

2005 - 2012

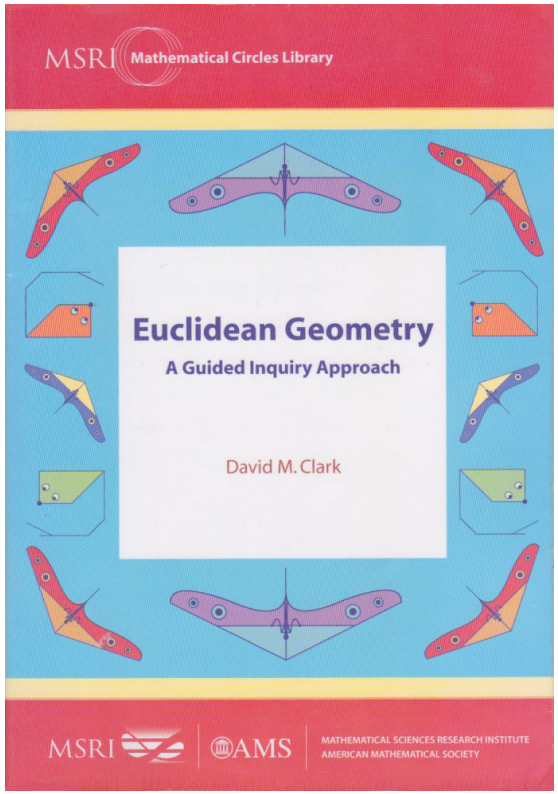


Sophomore/Junior

Euclidean Geometry

Ch 1. Congruent Figures
Ch 2. Neutral Geometry
Ch 3. Area Measure
Ch 4. Angle Measure
Ch 5. Similar Figures
Ch 6. Trigonometry
Ch 7. Circle Measure
Ch 8. Perspective Geometry

2005 - 2012



Sophomore/Junior

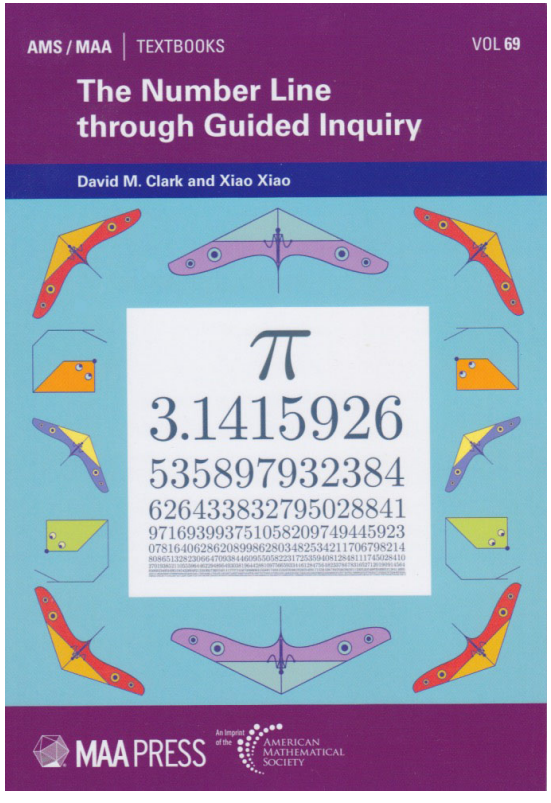
Xiao Xiao
Utica College

2012 - 2022

Xiao Xiao
Utica College

Xiao Xiao
Utica College

2012 - 2022

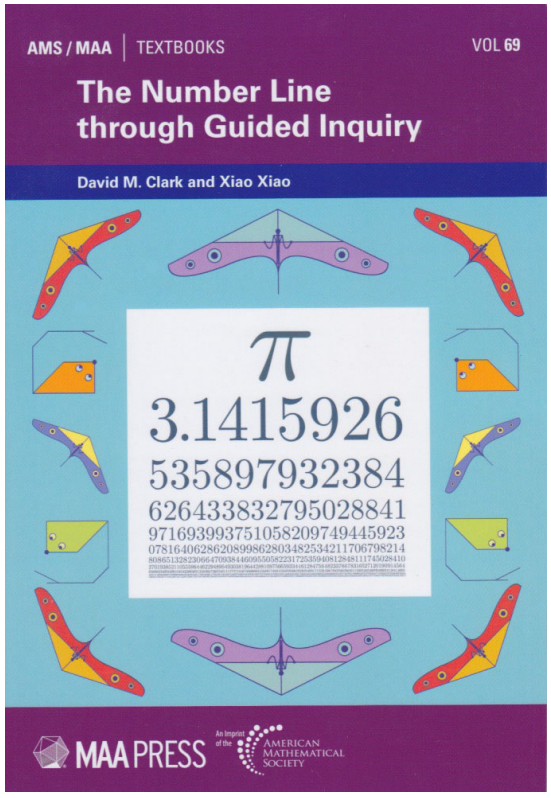


Junior/Senior

2012 - 2022

The Number Line

Ch 1. Missing Numbers
Ch 2. Limit Pts & Sequences
Ch 3. Decimal Representations
Ch 4. Complete Number Lines
Ch 5. Continuity
Ch 6. Calculus
Ch 7. Log & Exponential Fcns
Ch 8. The Real Number Line
Ch 9. The Price of Completeness



Junior/Senior

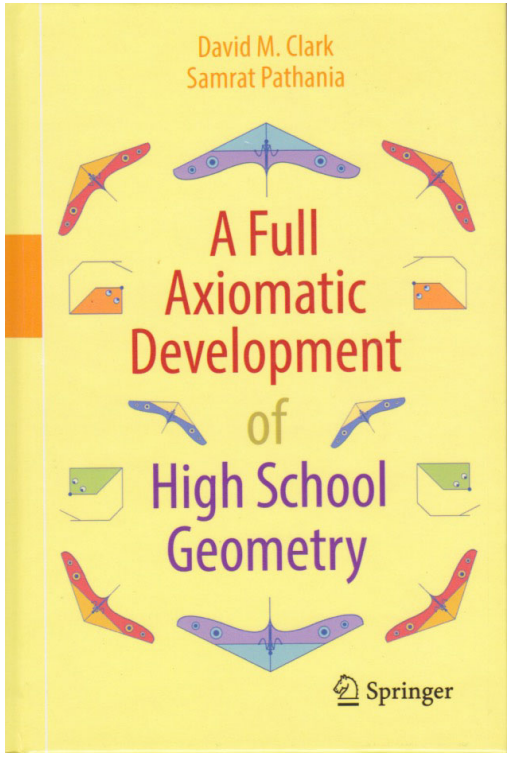
Samrat Pathania
Wallkill High School

2015 - 2023

Samrat Pathania
Wallkill High School

2015 - 2023

Samrat Pathania
Wallkill High School

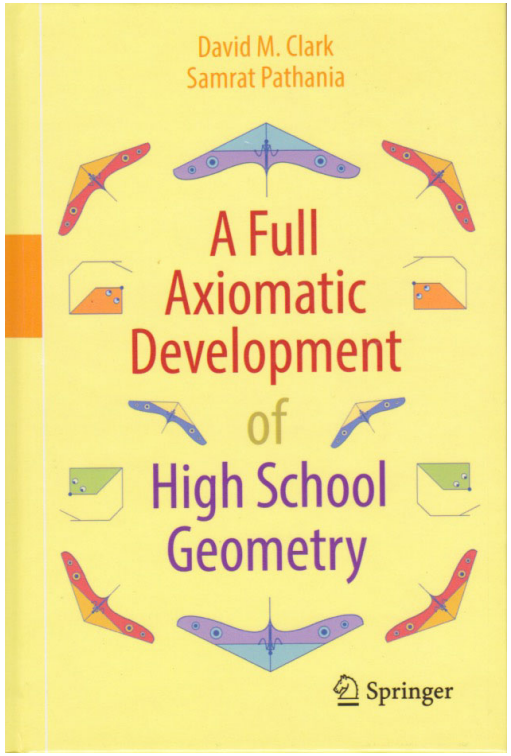


Senior/Graduate

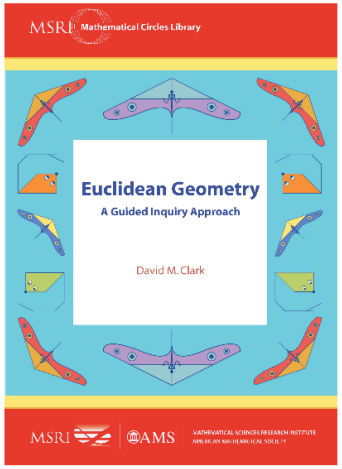
2015 - 2023

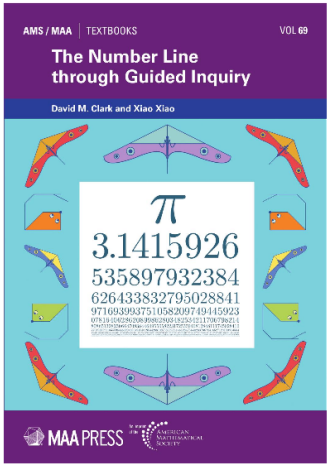
High School Geometry

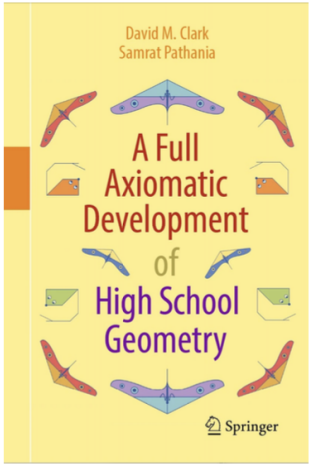
Ch 1. Foundational Principles
Ch 2. Neutral Geometry
Ch 3. Similar Figures
Ch 4. Area Measure
Ch 5. Angle Measure
Ch 6. Trigonometry
Ch 7. Circle Measure
Ch 8. Consistency & Models



Senior/Graduate





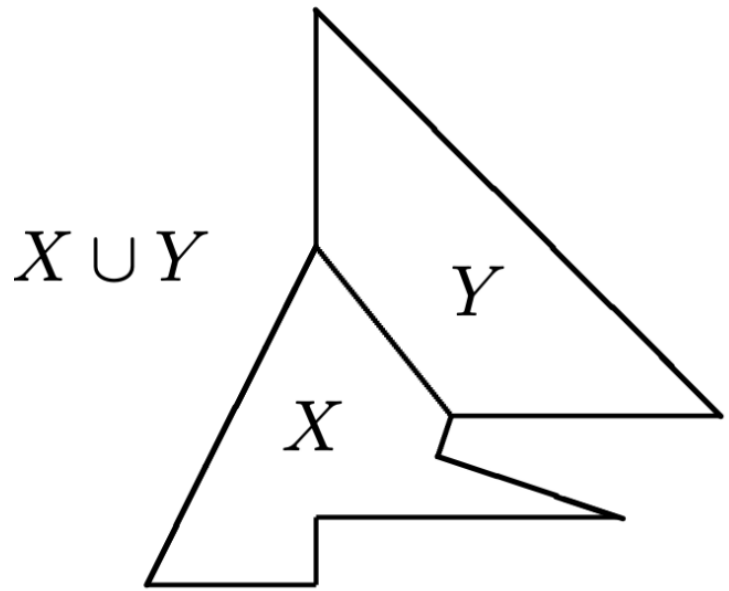


David M. Clark

⟨*clarkd@newpaltz.edu*⟩

(845) 663-3579

Area Measure Axiom. *There is an area measure function $\mathcal{A}$ on all closed regions that has the following properties.*

(iii) *If X and Y are closed regions that intersect only on their boundaries, then*

$$\mathcal{A}(X \cup Y) = \mathcal{A}(X) + \mathcal{A}(Y).$$