Table of Contents0F[[1]](#footnote-1)

Connecting Algebra and Geometry Through Coordinates

**Module Overview** 3

Topic A: Rectangular and Triangular Regions Defined by Inequalities (**G-GPE.B.7**) 7

 Lesson 1: Searching a Region in the Plane 9

 Lesson 2: Finding Systems of Inequalities That Describe Triangular and Rectangular Regions 18

 Lesson 3: Lines That Pass Through Regions 29

 Lesson 4: Designing a Search Robot to Find a Beacon 41

Topic B: Perpendicular and Parallel Lines in the Cartesian Plane (**G-GPE.B.4**, **G-GPE.B.5**) 52

 Lesson 5: Criterion for Perpendicularity 54

 Lesson 6: Segments That Meet at Right Angles 63

 Lesson 7: Equations for Lines Using Normal Segments 72

 Lesson 8: Parallel and Perpendicular Lines 81

**Mid-Module Assessment and Rubric** 92
*Topics A through B (assessment 1 day, return and remediation or further applications 1 day)*

Topic C:Perimeters and Areas of Polygonal Regions in the Cartesian Plane (**G-GPE.B.7**) 111

 Lesson 9: Perimeter and Area of Triangles in the Cartesian Plane 112

 Lesson 10: Perimeter and Area of Polygonal Regions in the Cartesian Plane 123

 Lesson 11: Perimeters and Areas of Polygonal Regions Defined by Systems of Inequalities 134

Topic D: Partitioning and Extending Segments and Parameterization of Lines (**G-GPE.B.4**, **G-GPE.B.6**) 143

 Lesson 12: Dividing Segments Proportionately 145

 Lesson 13: Analytic Proofs of Theorems Previously Proved by Synthetic Means 156

 Lesson 14: Motion Along a Line—Search Robots Again (Optional) 166

 Lesson 15: The Distance from a Point to a Line 175

1. Each lesson is ONE day, and ONE day is considered a 45-minute period. [↑](#footnote-ref-1)