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

Similarity, Proof, and Trigonometry

**Module Overview** 3

Topic A: Scale Drawings (**G-SRT.A.1**, **G-SRT.B.4, G-MG.A.3**) 9

Lesson 1: Scale Drawings 11

Lesson 2: Making Scale Drawings Using the Ratio Method 27

Lesson 3: Making Scale Drawings Using the Parallel Method 44

Lesson 4: Comparing the Ratio Method with the Parallel Method 59

Lesson 5: Scale Factors 72

Topic B: Dilations (**G-SRT.A.1**, **G-SRT.B.4**) 88

Lesson 6: Dilations as Transformations of the Plane 90

Lesson 7: How Do Dilations Map Segments? 104

Lesson 8: How Do Dilations Map Lines, Rays, and Circles? 120

Lesson 9:  How Do Dilations Map Angles? 135

Lesson 10:  Dividing the King’s Foot into 12 Equal Pieces 148

Lesson 11:  Dilations from Different Centers 162

Topic C: Similarity and Dilations (**G-SRT.A.2**, **G-SRT.A.3**, **G-SRT.B.5**, **G-MG.A.1**) 179

Lesson 12: What Are Similarity Transformations, and Why Do We Need Them? 181

Lesson 13: Properties of Similarity Transformations 195

Lesson 14: Similarity 217

Lesson 15: The Angle-Angle (AA) Criterion for Two Triangles to be Similar 229

Lesson 16: Between-Figure and Within-Figure Ratios 242

Lesson 17: The Side-Angle-Side (SAS) and Side-Side-Side (SSS) Criteria for Two Triangles   
to be Similar 255

Lesson 18: Similarity and the Angle Bisector Theorem 271

Lesson 19: Families of Parallel Lines and the Circumference of the Earth 283

Lesson 20: How Far Away Is the Moon? 297

**Mid-Module Assessment and Rubric** 306  
*Topics A through C (assessment 1 day, return 1 day, remediation or further applications 4 days)*

Topic D: Applying Similarity to Right Triangles (**G-SRT.B.4**) 333

Lesson 21: Special Relationships Within Right Triangles—Dividing into Two Similar   
Sub-Triangles 334

Lesson 22: Multiplying and Dividing Expressions with Radicals 348

Lesson 23: Adding and Subtracting Expressions with Radicals 363

Lesson 24: Prove the Pythagorean Theorem Using Similarity 373

Topic E: Trigonometry (**G-SRT.C.6**, **G-SRT.C.7**, **G-SRT.C.8**) 385

Lesson 25: Incredibly Useful Ratios 387

Lesson 26: The Definition of Sine, Cosine, and Tangent 401

Lesson 27: Sine and Cosine of Complementary Angles and Special Angles 414

Lesson 28: Solving Problems Using Sine and Cosine 424

Lesson 29: Applying Tangents 437

Lesson 30: Trigonometry and the Pythagorean Theorem 450

Lesson 31: Using Trigonometry to Determine Area 462

Lesson 32: Using Trigonometry to Find Side Lengths of an Acute Triangle 473

Lesson 33: Applying the Laws of Sines and Cosines 485

Lesson 34: Unknown Angles 498

**End-of-Module Assessment and Rubric** 511  
*Topics A through E (assessment 1 day, return 1 day, remediation or further applications 4 days)*

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