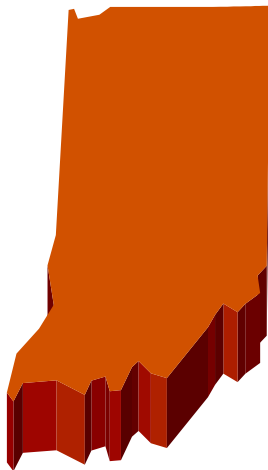
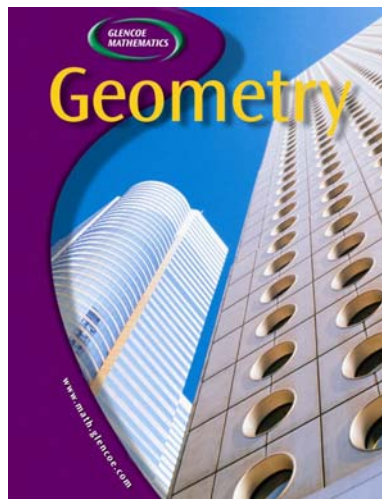


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INDIANA EDITION



alignment to

**Indiana  
Academic Mathematics Standards  
Geometry**

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**ALIGNMENT TO**

**INDIANA ACADEMIC MATHEMATICS STANDARDS**

**GEOMETRY**

<b>OBJECTIVES</b>	<b>PAGE REFERENCES</b>
<b>Standard 1</b>	
<b>Points, Lines, Angles, and Planes</b>	
<i>Students find lengths and midpoints of lines. They describe and use parallel and perpendicular lines. They find slopes and equations of lines.</i>	
G.1.1 Find the lengths and midpoints of line segments in one- or two-dimensional coordinate systems.	SE 21–23, 25, 715–716, 717, 718, 719  TWE: 21–23, 25, 715–716, 717, 718, 719
G.1.2 Construct congruent segments and angles, angle bisectors, and parallel and perpendicular lines using a straight edge and compass, explaining and justifying the process used.	SE 31–33, 44, 151, 200, 202, 207, 236  TWE: 31–33, 44, 151, 200, 202, 207, 236
G.1.3 Understand and use the relationships between special pairs of angles formed by parallel lines and transversals.	SE 126–127, 128, 133–134, 159–164  TWE: 126–127, 128, 133–134, 159–164
G.1.4 Use coordinate geometry to find slopes, parallel lines, perpendicular lines, and equations of lines.	SE 139, 140–141, 145, 415, 420, 432, 443  TWE: 139, 140–141, 145, 415, 420, 432, 443

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<b>OBJECTIVES</b>	<b>PAGE REFERENCES</b>
<b>Standard 2</b>	
<b>Polygons</b>	
<i>Students identify and describe polygons, and measure interior and exterior angles. They use congruence, similarity, symmetry, tessellations, and transformations. They find measures of sides, perimeters, and areas.</i>	
G.2.1 Identify and describe convex, concave, and regular polygons.	SE 45–46, 48, 405–406, 483–485 TWE: 45–46, 48, 405–406, 483–485
G.2.2 Find measures of interior and exterior angles of polygons, justifying the method used.	SE 186–187, 404–406 TWE: 186–187, 404–406
G.2.3 Use properties of congruent and similar polygons to solve problems.	SE 108, 186, 188, 192–194, 200–203, 207–210, 214–215, 289–292, 298–301, 326, 615 TWE: 108, 186, 188, 192–194, 200–203, 207–210, 214–215, 289–292, 298–301, 326, 615
G.2.4 Apply transformations (slides, flips, turns, expansions, and contractions) to polygons in order to determine congruence, similarity, symmetry, and tessellations. Know that images formed by slides, flips and turns are congruent to the original shape.	SE 462, 463–465, 466–469, 470–471, 476–478, 483–485, 489, 490–493, 506–508 TWE: 462, 463–465, 466–469, 470–471, 476–478, 483–485, 489, 490–493, 506–508
G.2.5 Find and use measures of sides, perimeters, and areas of polygons, and relate these measures to each other using formulas.	SE 46, 47, 316, 595–597, 601–604, 610–612, 617–618, 732–733 TWE: 46, 47, 316, 595–597, 601–604, 610–612, 617–618, 732–733

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<b>OBJECTIVES</b>	<b>PAGE REFERENCES</b>
G.2.6 Use coordinate geometry to prove properties of polygons such as regularity, congruence, and similarity.	SE 222–226, 230, 231, 233, 355, 447–451, 456, 457, 459, 469, 475  TWE: 222–226, 230, 231, 233, 355, 447–451, 456, 457, 459, 469, 475
<b>Standard 3</b>	
<b>Quadrilaterals</b>	
<i>Students identify and describe simple quadrilaterals. They use congruence and similarity. They find measures of sides, perimeters, and areas.</i>	
G.3.1 Describe, classify, and understand relationships among the quadrilaterals square, rectangle, rhombus, parallelogram, trapezoid, and kite.	SE 411–416, 417–422, 423, 424–430, 431–437, 438, 439–444, 445  TWE: 411–416, 417–422, 423, 424–430, 431–437, 438, 439–444, 445
G.3.2 Use properties of congruent and similar quadrilaterals to solve problems involving lengths and areas.	SE 289–293, 294–297, 615, 707–708  TWE: 289–293, 294–297, 615, 707–708
G.3.3 Find and use measures of sides, perimeters, and areas of quadrilaterals, and relate these measures to each other using formulas.	SE 46–47, 595–598, 601–604, 732– 733  TWE: 46–47, 595–598, 601–604, 732– 733
G.3.4 Use coordinate geometry to prove properties of quadrilaterals such as regularity, congruence, and similarity.	SE 447–451, 456, 457, 459, 469, 475  TWE: 447–451, 456, 457, 459, 469, 475
<b>Standard 4</b>	
<b>Triangles</b>	
<i>Students identify and describe types of triangles. They identify and draw altitudes, medians, and angle bisectors. They use congruence and similarity. They find measures of sides, perimeters, and areas. They apply inequality theorems.</i>	
G.4.1 Identify and describe triangles that are right, acute, obtuse, scalene, isosceles, equilateral, and equiangular.	SE 178–179  TWE: 178–179

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<b>OBJECTIVES</b>	<b>PAGE REFERENCES</b>
G.4.2 Define, identify, and construct altitudes, medians, angle bisectors, and perpendicular bisectors.	SE 32, 238–240, 241–242, 319, 440–441, 602, 655, 666  TWE: 32, 238–240, 241–242, 319, 440–441, 602, 655, 666
G.4.3 Construct triangles congruent to given triangles.	SE 200, 202, 207  TWE: 200, 202, 207
G.4.4 Use properties of congruent and similar triangles to solve problems involving lengths and areas.	SE 192–194, 291–292, 300–301, 308, 310, 316–318  TWE: 192–194, 291–292, 300–301, 308, 310, 316–318
G.4.5 Prove and apply theorems involving segments divided proportionally.	SE 101–106, 307–311, 313–314, 317–319  TWE: 101–106, 307–311, 313–314, 317–319
G.4.6 Prove that triangles are congruent or similar and use the concept of corresponding parts of congruent triangles.	SE 192, 249, 250, 307–310, 316–318, 357–359, 601–602  TWE: 192, 249, 250, 307–310, 316–318, 357–359, 601–602
G.4.7 Find and use measures of sides, perimeters, and areas of triangles, and relate these measures to each other using formulas.	SE 249, 250, 307–310, 316–318, 357–359, 601–602  TWE: 249, 250, 307–310, 316–318, 357–359, 601–602
G.4.8 Prove, understand, and apply the inequality theorems: triangle inequality, inequality in one triangle, and hinge theorem.	SE 247–250, 261–263, 267–270  TWE: 247–250, 261–263, 267–270

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<b>OBJECTIVES</b>	<b>PAGE REFERENCES</b>
G.4.9 Use coordinate geometry to prove properties of triangles such as regularity, congruence, and similarity.	SE 180, 194, 201, 222–226, 230, 231, 233, 241, 309, 352, 355, 359, 366  TWE: 180, 194, 201, 222–226, 230, 231, 233, 241, 309, 352, 355, 359, 366
<b>Standard 5</b>	
<b>Right Triangles</b>	
<i>Students prove the Pythagorean Theorem and use it to solve problems. They define and apply the trigonometric relations sine, cosine, and tangent.</i>	
G.5.1 Prove and use the Pythagorean Theorem.	SE 21, 349–358, 387, 393  TWE: 21, 349–358, 387, 393
G.5.2 State and apply the relationships that exist when the altitude is drawn to the hypotenuse of a right triangle.	SE 343–348, 350, 363, 377, 392  TWE: 343–348, 350, 363, 377, 392
G.5.3 Use special right triangles ( $30^\circ - 60^\circ$ and $45^\circ - 45^\circ$ ) to solve problems.	SE 357–359, 393–394  TWE: 357–359, 393–394
G.5.4 Define and use the trigonometric functions (sine, cosine, tangent, cosecant, secant, cotangent) in terms of angles of right triangles.	SE 364–366, 370, 377–379, 385–387, 391, 609  TWE: 364–366, 370, 377–379, 385–387, 391, 609
G.5.5 Know and use the relationship $\sin^2 x + \cos^2 x = 1$ .	SE 391  TWE: 391
G.5.6 Solve word problems involving right triangles.	SE 21, 349–356, 364–366, 393  TWE: 21, 349–356, 364–366, 393

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<b>OBJECTIVES</b>	<b>PAGE REFERENCES</b>
<b>Standard 6</b>	
<b>Circles</b>	
<i>Students define ideas related to circles: e.g., radius, tangent. They find measures of angles, lengths, and areas. They prove theorems about circles. They find equations of circles.</i>	
G.6.1 Find the center of a given circle. Construct the circle that passes through three given points (not in a straight line).	SE 522, 541, 559, 577 TWE: 522, 541, 559, 577
G.6.2 Define and identify relationships among: radius, diameter, arc, measure of an arc, chord, secant, and tangent.	SE 522, 536–539, 552–553, 561–564 TWE: 522, 536–539, 552–553, 561–564
G.6.3 Prove theorems related to circles.	SE 528, 534, 541, 545, 548–550, 556–558, 561, 566–568, 573, 587 TWE: 528, 534, 541, 545, 548–550, 556–558, 561, 566–568, 573, 587
G.6.4 Construct tangents to circles, and circumscribe and inscribe circles.	SE 552, 554, 556, 559, 560 TWE: 552, 554, 556, 559, 560
G.6.5 Define, find, and use measures of arcs and related angles (central, inscribed, and intersections of secants and tangents).	SE 529–532, 536–539, 544–548, 552–555, 558, 561–564, 570–571 TWE: 529–532, 536–539, 544–548, 552–555, 558, 561–564, 570–571
G.6.6 Define and identify congruent and concentric circles.	SE 528 TWE: 528
G.6.7 Define, find, and use measures of circumference, arc length, and areas of circles and sectors. Use these measures to solve problems.	SE 523–525, 530–532, 536–538, 545–548, 612, 623–624 TWE: 523–525, 530–532, 536–538, 545–548, 612, 623–624

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<b>OBJECTIVES</b>	<b>PAGE REFERENCES</b>
G.6.8 Find the equation of a circle in the coordinate plane in terms of its center and radius.	SE 575–577 TWE: 575–577
<b>Standard 7</b>	
<b>Polyhedra and Other Solids</b>	
<i>Students describe and make polyhedra and other solids. They describe relationships and symmetries, and use congruence and similarity.</i>	
G.7.1 Describe and make regular and non-regular polyhedra.	SE 637, 638, 643–645, 649, 660 TWE: 637, 638, 643–645, 649, 660
G.7.2 Describe the polyhedron that can be made from a given net (or pattern). Describe the net for a given polyhedron.	SE 50, 643–645, 649, 660 TWE: 50, 643–645, 649, 660
G.7.3 Describe relationships between the faces, edges, and vertices of polyhedra.	SE 637–638 TWE: 637–638
G.7.4 Describe symmetries of geometric solids.	SE 642 TWE: 642
G.7.5 Describe sets of points on spheres: chords, tangents, and great circles.	SE 638, 671–672 TWE: 638, 671–672
G.7.6 Identify and know properties of congruent and similar solids.	SE 707–710 TWE: 707–710
G.7.7 Find and use measures of sides, volumes of solids, and surface areas of solids, and relate these measures to each other using formulas.	SE 637–638, 645, 649, 650, 655–656, 667, 672, 688 TWE: 637–638, 645, 649, 650, 655–656, 667, 672, 688

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OBJECTIVES	PAGE REFERENCES
<b>Standard 8</b>	
<b>Mathematical Reasoning and Problem Solving</b>	
<i>Students use a variety of strategies to solve problems.</i>	
G.8.1 Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess-and-check, solving a simpler problem, writing an equation, and working backwards.	This objective is addressed throughout. See for example:  SE 79, 90, 104, 212, 253, 369, 389, 444, 557, 608, 641, 658, 693, 706, 719  TWE: 79, 90, 104, 212, 253, 369, 389, 444, 557, 608, 641, 658, 693, 706, 719
G.8.2 Decide whether a solution is reasonable in the context of the original situation.	The opportunity to address this objective is available throughout. See for example:  SE 79, 90, 104, 212, 253, 369, 389, 444, 557, 608, 641, 658, 693, 706, 719  TWE: 79, 90, 104, 212, 253, 369, 389, 444, 557, 608, 641, 658, 693, 706, 719
<i>Students develop and evaluate mathematical arguments and proofs.</i>	
G.8.3 Make conjectures about geometric ideas. Distinguish between information that supports a conjecture and proof of a conjecture.	SE 22, 62–64, 77, 115, 324  TWE: 22, 62–64, 77, 115, 324
G.8.4 Write and interpret statements of the form “if – then” and “if and only if.”	SE 22, 62–64, 75–77, 81–83, 90, 95–96, 115, 324  TWE: 22, 62–64, 75–77, 81–83, 90, 95–96, 115, 324

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<b>OBJECTIVES</b>	<b>PAGE REFERENCES</b>
G.8.5 State, use, and examine the validity of the converse, inverse, and contrapositive of “if – then” statements.	SE 77, 81 TWE: 77, 81
G.8.6 Identify and give examples of undefined terms, axioms, and theorems, and inductive and deductive proof.	This objective is addressed throughout. See for example:  SE 90–93, 94–95, 222, 255–260, 277, 304, 317, 376, 389, 447–451, 528, 541, 567  TWE: 90–93, 94–95, 222, 255–260, 277, 304, 317, 376, 389, 447–451, 528, 541, 567
G.8.7 Construct logical arguments, judge their validity, and give counterexamples to disprove statements.	SE 63–65, 77–81, 93, 121, 196, 242, 387, 422, 429, 457, 467, 493, 607, 675  TWE: 63–65, 77–81, 93, 121, 196, 242, 387, 422, 429, 457, 467, 493, 607, 675
G.8.8 Write geometric proofs, including proofs by contradiction and proofs involving coordinate geometry. Use and compare a variety of ways to present deductive proofs, such as flow chart, paragraph, two-column, and indirect.	This objective is addressed throughout. See for example:  SE 90–93, 94–95, 222, 255–260, 277, 304, 317, 376, 389, 447–451, 528, 541, 567  TWE: 90–93, 94–95, 222, 255–260, 277, 304, 317, 376, 389, 447–451, 528, 541, 567

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G.8.9 Perform basic constructions, describing and justifying the procedures used. Distinguish between constructing and drawing geometric figures.	SE 24, 31–33, 44, 151, 200, 202, 207, 236, 311, 441, 541–542, 556, 559, 560  TWE: 24, 31–33, 44, 151, 200, 202, 207, 236, 311, 441, 541–542, 556, 559, 560

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