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STANDARDS

PAGE REFERENCES

Arizona Mathematics Standards Articulated by Grade Level

Analytic geometry connects algebra and geometry, resulting in powerful methods of analysis and problem solving. Just as the number line associates numbers with locations in one dimension, a pair of perpendicular axes associates pairs of numbers with locations in two dimensions. This correspondence between numerical coordinates and geometric points allows methods from algebra to be applied to geometry and vice versa. The solution set of an equation becomes a geometric curve, making visualization a tool for doing and understanding algebra. Geometric shapes can be described by equations, making algebraic manipulation into a tool for geometric understanding, modeling, and proof. Geometric transformations of the graphs of equations correspond to algebraic changes in their equations.

Dynamic geometry environments provide students with experimental and modeling tools that allow them to investigate geometric phenomena in much the same way as computer algebra systems allow them to experiment with algebraic phenomena.

STANDARDS	PAGE REFERENCES
<p>Geometry: Congruence (G-CO) Experiment with transformations in the plane</p>	
<p>HS.G-CO.1. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. Connection: 9-10.RST.4</p>	<p>Student Edition: 5-12, 13, 14-21, 46-54, 173-178, 191-195, 697-699, 709 <i>Construction</i> 17 <i>Geometry Lab</i> 13 <i>Key Concept</i> 5, 15, 16, 46, 47, 48, 49, 173, 174, 697 <i>Postulate</i> 191 <i>Reading Math</i> 174, 698 <i>Study Tip</i> 6, 7, 15, 175, 709 <i>Watch Out!</i> 174, 709</p> <p>Teacher Edition: AE 6-7, 15-17, 47-49, 174-175; DI 10; FA 13; FCA 13; NTM 12; SQ 5, 14, 173; TNT 6</p>
<p>HS.G-CO.2. Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch). Connection: ETHS-S6C1-03</p>	<p>Student Edition: 294-295, 623-631, 632-638, 639, 640-646, 650, 651-659, 670-671, 672-673, 674-681, 682-683, 685-688 <i>Geometry Lab</i> 639, 670-671 <i>Graphing Technology Lab</i> 294-295, 650, 672-673 <i>Key Concept</i> 632, 633, 640, 641, 651 <i>Study Tip</i> 624, 625, 641, 642, 652 <i>Theorem</i> 652, 653</p> <p>Teacher Edition: AE 624-626, 633-634, 641-642, 652-654; SQ 632</p>
<p>HS.G-CO.3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself. Connections: ETHS-S6C1-03; 9-10.WHST.2c</p>	<p>Student Edition: 294-295, 623-631, 639, 640-646, 647-648, 649, 650, 651-659, 682-683, 685-688 <i>Geometry Lab</i> 639, 647-648 <i>Graphing Technology Lab</i> 294-295, 650 <i>Key Concept</i> 632, 633, 640, 641, 651 <i>Study Tip</i> 624, 625, 641, 642, 652 <i>Theorem</i> 652, 653</p> <p>Teacher Edition: AE 624-626, 633-634, 641-642, 652-654; SQ 623</p>

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<p>HS.G-CO.4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.</p> <p>Connections: ETHS-S6C1-03; 9-10.WHST.4</p>	<p>Student Edition: 294-295, 623-626, 632-634, 639, 640-642, 647-648, 650, 651-654, 660-662, 682-683, 685-687 <i>Geometry Lab</i> 639, 647-648, 660-662 <i>Graphing Technology Lab</i> 294-295, 650 <i>Key Concept</i> 623, 632, 633, 640, 641, 651 <i>Reading Math</i> 625 <i>Study Tip</i> 624, 625, 641, 642, 652 <i>Theorem</i> 652, 653</p> <p>Teacher Edition: AE 624-626, 633-634, 641-642, 652-654; SQ 623</p>
<p>HS.G-CO.5. Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.</p> <p>Connections: ETHS-S6C1-03; 9-10.WHST.3</p>	<p>Student Edition: 294-295, 621, 623-631, 632-638, 639, 640-646, 647-648, 650, 651-659, 660-662, 670-671, 682-683, 685-687 <i>Geometry Lab</i> 639, 647-648, 660-662 <i>Graphing Technology Lab</i> 294-295, 650 <i>Key Concept</i> 623, 632, 633, 640, 641, 651 <i>Reading Math</i> 625 <i>Study Tip</i> 624, 625, 641, 642, 652 <i>Theorem</i> 652, 653</p> <p>Teacher Edition: AE 624-626, 633-634, 641-642, 652-654; SQ 623</p>
<p>HS.G-CO.6. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.</p> <p>Connections: ETHS-S1C2-01; 9-10.WHST.1e</p>	<p>Student Edition: 264-271, 275-282, 283-284, 294-295, 623-626, 632-634, 639, 640-642, 647-648, 650, 651-654, 660-662, 682-683, 685-687 <i>Concept Summary</i> 278 <i>Construction</i> 266, 267, 275 <i>Geometry Lab</i> 283-284, 639, 647-648, 660-662, 682-683 <i>Graphing Technology Lab</i> 294-295, 650 <i>Key Concept</i> 623, 632, 633, 640, 641, 651 <i>Proof</i> 264, 266, 276 <i>Reading Math</i> 265 <i>Study Tip</i> 266, 268, 277, 624, 625, 641, 642, 652 <i>Test-Taking Tip</i> 265 <i>Theorem</i> 276, 284, 652, 653</p> <p>Teacher Edition: AE 266, 276-277, 624-626, 633-634, 641-642, 652-654; SQ 264, 275-276, 623</p>

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<p>HS.G-CO.7. Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.</p> <p>Connection: 9-10.WHST.1e</p>	<p>Student Edition: 255-263, 264-271, 275-282, 283-284, 294-295, 623-626, 632-634, 639, 640-642, 647-648, 650, 651-654, 660-662, 682-683, 685-687</p> <p><i>Concept Summary</i> 278</p> <p><i>Construction</i> 266, 267, 275</p> <p><i>Geometry Lab</i> 283-284, 639, 647-648, 660-662, 682-683</p> <p><i>Graphing Technology Lab</i> 294-295, 650</p> <p><i>Key Concept</i> 255, 623, 632, 633, 640, 641, 651</p> <p><i>Proof</i> 264, 266, 276</p> <p><i>Reading Math</i> 265</p> <p><i>Study Tip</i> 256, 257, 266, 268, 277, 624, 625, 641, 642, 652</p> <p><i>Test-Taking Tip</i> 265</p> <p><i>Theorem</i> 257, 258, 276, 284, 652, 653</p> <p>Teacher Edition: AE 256-257, 265-268, 276-277, 624-626, 633-634, 641-642, 652-654; SQ 255, 264, 275-276</p>
<p>HS.G-CO.8. Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.</p> <p>Connection: 9-10.WHST.1e</p>	<p>Student Edition: 255-263, 264-272, 273, 275-282, 682-683</p> <p><i>Construction</i> 266, 267</p> <p><i>Geometry Lab</i> 273, 682-683</p> <p><i>Key Concept</i> 255</p> <p><i>Postulate</i> 264, 266</p> <p><i>Study Tip</i> 256, 257, 266, 268</p> <p><i>Test-Taking Tip</i> 265</p> <p><i>Theorem</i> 257, 258</p> <p>Teacher Edition: AE 256-257, 265-268; DI 257, 272; FCA 682; FMC 258, 266; SQ 255, 264; WO 258, 271</p>

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<p>HS.G-CO.9. Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.</p> <p>Connections: ETHS-S1C2-01; 9-10.WHST.1a-1e</p>	<p>Student Edition: 179, 180-186, 207-214, 215-224, 246-254, 273, 303-309 <i>Construction</i> 207, 222 <i>Corollary</i> 249 <i>Geometry Lab</i> 273 <i>Geometry Software Lab</i> 179 <i>Key Concept</i> 215, 218, 303 <i>Postulate</i> 180, 207, 208, 215 <i>Proof</i> 181, 246, 248 <i>Study Tip</i> 182, 208, 209, 210, 216, 217, 218, 249, 304 <i>Theorem</i> 181, 182, 208, 218, 246, 248</p> <p>Teacher Edition: AE 181-182, 208-210, 216-218, 247-249, 304-305</p>
<p>HS.G-CO.10. Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.</p> <p>Connections: ETHS-S1C2-01; 9-10.WHST.1a-1e</p>	<p>Student Edition: 246-254, 255-263, 264-272, 273, 275-282, 283-284, 285-293, 294-295, 303-309, 312-314, 326, 331, 341-342, 346, 355-362, 363, 372-377, 595 <i>Concept Summary</i> 278 <i>Construction</i> 266, 267, 275 <i>Corollary</i> 249, 286 <i>Geometry Lab</i> 273, 283-284 <i>Postulates</i> 264, 266, 275 <i>Problem-Solving Tip</i> 247 <i>Proof</i> 246, 248, 276, 286 <i>Study Tip</i> 248, 249, 256, 257, 268, 277, 304 <i>Theorem</i> 248, 257, 258, 276, 284, 285</p>
<p>HS.G-CO.11. Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.</p> <p>Connection: 9-10.WHST.1a-1e</p>	<p>Student Edition: 403-411, 412, 413-421, 423-429, 430-438, 450-452 <i>Concept Summary</i> 415, 431 <i>Graphing Technology Lab</i> 412 <i>Proof</i> 404, 414, 430 <i>Study Tip</i> 404, 405, 406, 416, 424, 432, 434 <i>Theorem</i> 403, 405, 423, 424, 430, 432 <i>Watch Out!</i> 415</p> <p>Teacher Edition: AE 404-406, 414-416, 424-425, 431-434; DI 408; SQ 403-404, 413, 423-424, 430-431; WO 404, 437</p>

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<p>HS.G-CO.12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).</p> <p>Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.</p> <p>Connection: ETHS-S6C1-03</p>	<p>Student Edition: 17, 30, 39, 40, 55, 179, 207, 222, 245, 266, 267, 273, 275, 294-295, 323, 334, 494, 670-671, 672-673, 718, 734, 740</p> <p><i>Constructions</i> 17, 39, 40, 207, 266, 267, 275, 494, 718, 734</p> <p><i>Geometry Lab</i> 55, 245, 273, 323, 334, 670-671, 740</p> <p><i>Geometry Software Lab</i> 179, 294-295, 672-673</p>
<p>HS.G-CO.13. Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.</p> <p>Connection: ETHS-S6C1-03</p>	<p>Student Edition: 740, 816-817</p> <p><i>Geometry Lab</i> 740, 816-817</p>
<p style="text-align: center;">Geometry: Similarity, Right Triangles, and Trigonometry (G-SRT) Understand similarity in terms of similarity transformations</p>	
<p>HS.G-SRT.1. Verify experimentally the properties of dilations given by a center and a scale factor:</p> <p>Connections: ETHS-S1C2-01; 9-10.WHST.1b; 9-10.WHST.1e</p>	<p>Student Edition: 672-673, 674-681, 682-683, 688, 689 #4-#5, 705 #59-#62, 714 #70-#71</p> <p><i>Geometry Lab</i> 682-683</p> <p><i>Graphing Technology Lab</i> 672-673</p> <p><i>Key Concept</i> 674, 676</p> <p><i>Problem-Solving Tip</i> 675</p> <p><i>Study Tip</i> 676</p> <p>Teacher Edition: AE 675-676; DI 676; FCA 682; SQ 674</p>
<p>a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.</p>	<p>Student Edition: 672-673, 674-681, 682-683, 688, 689 #4-#5, 705 #59-#62, 714 #70-#71</p> <p><i>Geometry Lab</i> 682-683</p> <p><i>Graphing Technology Lab</i> 672-673</p> <p><i>Key Concept</i> 674, 676</p> <p><i>Problem-Solving Tip</i> 675</p> <p><i>Study Tip</i> 676</p> <p>Teacher Edition: AE 675-676; FCA 682; FMC 676; SQ 674</p>

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<p>b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.</p>	<p>Student Edition: 672-673, 674-681, 682-683, 688, 689 #4-#5, 705 #59-#62, 714 #70-#71 <i>Geometry Lab</i> 682-683 <i>Graphing Technology Lab</i> 672-673 <i>Key Concept</i> 674, 676 <i>Problem-Solving Tip</i> 675 <i>Study Tip</i> 676</p> <p>Teacher Edition: AE 675-676; FCA 682; SQ 674; WO 676</p>
<p>HS.G-SRT.2. Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.</p> <p>Connections: ETHS-S1C2-01; 9-10.RST.4; 9-10.WHST.1c</p>	<p>Student Edition: 469-477, 478-487, 488-489, 511-517, 518-523, 527-528, 529, 537-545, 682-683 <i>Concept Summary</i> 482, 511 <i>Geometry Lab</i> 488-489, 682-683 <i>Key Concept</i> 469, 537 <i>Postulate</i> 478 <i>Problem-Solving Tip</i> 482 <i>Proof</i> 479 <i>Study Tip</i> 470, 471, 480, 481, 512, 513, 519, 538, 539 <i>Test-Taking Tip</i> 480 <i>Theorem</i> 471, 479, 481 <i>Watch Out!</i> 472</p> <p>Teacher Edition: AE 470-472, 479-482, 512-513, 519, 538-540</p>
<p>HS.G-SRT.3. Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.</p> <p>Connections: ETHS-S1C2-01; 9-10.RST.7</p>	<p>Student Edition: 478-487, 488-489, 490-499, 501-508, 537-545 <i>Concept Summary</i> 482 <i>Construction</i> 494 <i>Corollary</i> 492, 493 <i>Geometry Lab</i> 488-489 <i>Key Concept</i> 537 <i>Postulate</i> 478 <i>Proof</i> 479, 502 <i>Study Tip</i> 479, 480, 481, 491, 492, 502, 538, 539 <i>Theorem</i> 479, 481, 490, 491, 501</p> <p>Teacher Edition: AE 479-482, 491-494, 502-504, 538-540</p>

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<p>HS.G-SRT.4. Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.</p> <p>Connections: ETHS-S1C2-01; 9-10.WHST.1a-1e</p>	<p>Student Edition: 488-489, 490-499, 501-508, 537-545, 546, 547-555, 558-566 <i>Construction</i> 494 <i>Corollary</i> 492, 493 <i>Geometry Lab</i> 488-489, 546 <i>Key Concept</i> 537, 548 <i>Problem-Solving Tip</i> 561 <i>Proof</i> 502, 547 <i>Study Tip</i> 491, 492, 502, 538, 539, 548, 550, 559 <i>Test-Taking Tip</i> 549 <i>Theorem</i> 490, 491, 501, 547, 550, 558, 560</p> <p>Teacher Edition: AE 491-494, 502-504, 538-540, 548-551, 559-561</p>
<p>HS.G-SRT.5. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.</p> <p>Connections: ETHS-S1C2-01; 9-10.WHST.1a-1e</p>	<p>Student Edition: 255-263, 264-272, 273, 275-282, 283-284, 285-293, 294-295, 324-333, 334, 335-343, 478-487, 488-489, 490-499, 501-508, 511-517, 518-523 <i>Concept Summary</i> 339, 482 <i>Geometry Lab</i> 273, 334, 488-489 <i>Graphing Technology Lab</i> 294-295 <i>Key Concept</i> 255, 337 <i>Proof</i> 286, 326, 479 <i>Study Tip</i> 256, 325, 338 <i>Theorem</i> 257, 258, 285, 324, 325, 327, 328, 335, 479, 481, 490, 491</p>
<p>HS.G-SRT.6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.</p> <p>Connection: ETHS-S6C1-03</p>	<p>Student Edition: 537-545, 547, 567, 568-577, 578, 580-587 <i>Graphing Technology Lab</i> 567, 578 <i>Key Concept</i> 537, 568, 571 <i>Proof</i> 547 <i>Study Tip</i> 538, 539, 569, 570, 571, 572, 582 <i>Theorem</i> 538, 539, 547 <i>Watch Out!</i> 572, 581</p> <p>Teacher Edition: AE 538-540, 569-572, 581-582; SQ 537, 538, 580</p>

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<p>HS.G-SRT.7. Explain and use the relationship between the sine and cosine of complementary angles.</p> <p>Connections: ETHS-S1C2-01; ETHS-S6C1-03; 9-10.WHST.1c; 9-10.WHST.1e</p>	<p>Student Edition: 568-575, 576 #64-#65 <i>Key Concept</i> 568, 571 <i>Reading Math</i> 571 <i>Study Tip</i> 569, 570, 571, 572 <i>Watch Out!</i> 572</p> <p>Teacher Edition: AE 569-572; DI 572</p>
<p>HS.G-SRT.8. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.</p> <p>Connections: ETHS-S6C2-03; 9-10.RST.7</p>	<p>Student Edition: 546, 547-555, 558-566, 567, 568-577, 578 <i>Geometry Lab</i> 546 <i>Graphing Technology Lab</i> 567, 578 <i>Key Concept</i> 568, 571 <i>Problem-Solving Tip</i> 561 <i>Proof</i> 547 <i>Reading Math</i> 549 <i>Review Vocabulary</i> 551, 559 <i>Study Tip</i> 548, 549, 550, 559, 560, 569, 570, 571, 572 <i>Test-Taking Tip</i> 549 <i>Theorem</i> 547, 558 <i>Watch Out!</i> 572</p> <p>Teacher Edition: AE 548-551, 559-561, 569-572; DI 549, 550; FMC 549; SQ 547, 558, 568; WO 548, 565</p>
<p>HS.G-SRT.9. Derive the formula $A = \frac{1}{2} ab \sin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.</p> <p>Connection: ETHS-S6C1-03</p>	<p>Student Edition: 596 #53</p>
<p>HS.G-SRT.10. Prove the Laws of Sines and Cosines and use them to solve problems.</p> <p>Connections: ETHS-S6C1-03; 11-12.WHST.1a-1e</p>	<p>Student Edition: 588-597, 598-599, 608 #58-#60, 613, 615 #17-#18, 617 #2, 619 #7, 631 #59 <i>Concept Summary</i> 592 <i>Geometry Lab</i> 598-599 <i>Reading Math</i> 591 <i>Study Tip</i> 589, 590 <i>Theorem</i> 588, 589 <i>Watch Out!</i> 589, 591</p> <p>Teacher Edition: AE 589-591; DI 591; FMC 590; FU 597; TNT 590; TWT 591; WCG 598; WO 596</p>

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<p>HS.G-SRT.11. Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).</p> <p>Connections: 11-12.WHST.2c; 11-12.WHST.2e</p>	<p>Student Edition: 588-597, 598-599, 608 #58-#60, 613, 615 #17-#18, 617 #2, 619 #7, 631 #59 <i>Concept Summary</i> 592 <i>Geometry Lab</i> 598-599 <i>Reading Math</i> 591 <i>Study Tip</i> 589, 590 <i>Theorem</i> 588, 589 <i>Watch Out!</i> 589, 591</p> <p>Teacher Edition: AE 589-591; DI 591; FMC 590; FU 597; TNT 590; TWT 591; WCG 598; WO 596</p>
<p>Geometry: Circles (G-C) Understand and apply theorems about circles</p>	
<p>HS.G-C.1. Prove that all circles are similar.</p> <p>Connections: ETHS-S1C2-01; 9-10.WHST.1a-1e</p>	<p>Student Edition: 698, 705</p> <p>Teacher Edition: FU 705</p>
<p>HS.G-C.2. Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.</p> <p>Connections: 9-10.WHST.1c; 11-12.WHST.1c</p>	<p>Student Edition: 696, 697-703, 715-722, 723-730, 732-739, 740, 741-749, 750-756, 772-773 <i>Construction</i> 718, 734 <i>Geometry Lab</i> 740 <i>Key Concept</i> 697, 698, 699, 745 <i>Reading Math</i> 698 <i>Study Tip</i> 700, 716, 717, 725, 726 <i>Theorem</i> 715, 716, 717, 723, 724, 725, 726, 733, 742, 743 <i>Vocabulary Link</i> 724 <i>Watch Out!</i> 735</p> <p>Teacher Edition: DI 730, 749; FMC 700, 743; SQ 697, 715, 723-724; WO 699</p>
<p>HS.G-C.3. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.</p> <p>Connection: ETHS-S6C1-03</p>	<p>Student Edition: 700-704, 725-730, 735, 740 <i>Geometry Lab</i> 740 <i>Study Tip</i> 700, 726 <i>Theorem</i> 725, 726 <i>Watch Out!</i> 735</p> <p>Teacher Edition: DI 735; ETC 740; FCA 740; FMC 700, 726; TT 740</p>

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<p>HS.G-C.4. Construct a tangent line from a point outside a given circle to the circle. Connection: ETHS-S6C1-03</p>	<p>Student Edition: 732, 734 <i>Construction</i> 734 Teacher Edition: AE 733</p>
<p>HS.G-C.5. Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector. Connections: ETHS-S1C2-01; 11-12.RST.4</p>	<p>Student Edition: 706-714, 798-804 <i>Key Concept</i> 706, 707, 798, 799 <i>Postulate</i> 708 <i>Review Vocabulary</i> 799 <i>Study Tip</i> 707, 709 <i>Theorem</i> 707 <i>Watch Out!</i> 709 Teacher Edition: AE 707-709, 799; DI 708, 709, 712; FMC 800; SQ 706, 798; TWT 800; WO 713</p>
<p>Geometry: Expressing Geometric Properties with Equations (G-GPE) Translate between the geometric description and the equation for a conic section</p>	
<p>HS.G-GPE.1. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation. Connections: ETHS-S1C2-01; 11-12.RST.4</p>	<p>Student Edition: 757-763, 770, 775 #13, 786 #46-#49 <i>Key Concept</i> 757 <i>Study Tip</i> 758, 759 Teacher Edition: AE 758-759; DI 759, 763; SQ 757; TWT 758; WO 758</p>
<p>HS.G-GPE.2. Derive the equation of a parabola given a focus and directrix. Connections: ETHS-S1C2-01; 11-12.RST.4</p>	<p>Student Edition: 764-765 <i>Geometry Lab</i> 764-765 Teacher Edition: DI 765; FA 765; FCA 765; FMC 764; TT 764, 765; WCG 764</p>
<p>HS.G-GPE.3. Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant. Connections: ETHS-S1C2-01; 11-12.RST.4</p>	<p>While this concept is not covered, ellipses are introduced in the following reference. Student Edition: <i>Geometry Lab</i> 764-765</p>

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<p>HS.G-GPE.4. Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point $(1, \sqrt{3})$ lies on the circle centered at the origin and containing the point $(0, 2)$.</p> <p>Connections: ETHS-S1C2-01; 9-10.WHST.1a-1e; 11-12.WHST.1a-1e</p>	<p>Student Edition: 257, 265-266, 303-309, 314, 315 #20, 333, 343, 416-417, 440-442, 445, 517, 556-557, 757, 816-817 <i>Geometry Lab</i> 556-557 <i>Key Concept</i> 303 <i>Study Tip</i> 304</p> <p>Teacher Edition: AE 266, 304-305, 441-442; DI 257, 305, 309; FMC 305; SQ 303; TNT 305; TWT 305</p>
<p>HS.G-GPE.5. Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).</p> <p>Connection: 9-10.WHST.1a-1e</p>	<p>Student Edition: 188-196, 197, 200, 203, 206, 207-214, 215-224, 226-228, 304-305, 343, 488-489 <i>Concept Summary</i> 189 <i>Construction</i> 207 <i>Geometry Lab</i> 206, 488-489 <i>Key Concept</i> 188, 215, 218 <i>Mid-Chapter Quiz</i> 197 <i>Postulate</i> 191, 207, 208, 215 <i>Study Tip</i> 189, 196, 208, 209, 210, 216, 217, 218, 220 <i>Theorem</i> 208, 218</p> <p>Teacher Edition: AE 189-192, 208-210, 216-218, 304; DI 209, 210</p>
<p>HS.G-GPE.6. Find the point on a directed line segment between two given points that partitions the segment in a given ratio.</p> <p>Connections: ETHS-S1C2-01; 9-10.RST.3</p>	<p>Student Edition: 25-35, 129-131, 206, 441-442, 491-494 <i>Construction</i> 494 <i>Corollary</i> 492, 493 <i>Geometry Lab</i> 206 <i>Key Concept</i> 25 <i>Study Tip</i> 26, 27, 492 <i>Theorem</i> 491</p> <p>Teacher Edition: AE 26-29, 129, 442, 492-494; DI 309; SQ 25</p>

STANDARDS	PAGE REFERENCES
<p>HS.G-GPE.7. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.</p> <p>Connections: ETHS-S1C2-01; 9-10.RST.3; 11-12.RST.3</p>	<p>Student Edition: 25-32, 45 #7-#8, 60, 65-66, 441-442, 445, 757, 765, 785, 786 #42, 787-788, 813 #29-#31, 816-817, 828 #33-#34 <i>Geometry Lab</i> 65, 816-817 <i>Geometry Software Lab</i> 65-66 <i>Graphing Technology Lab</i> 787-788 <i>Key Concept</i> 26, 27 <i>Study Tip</i> 26, 27, 28</p> <p>Teacher Edition: AE 26-28, 60, 442</p>
<p>Geometry: Geometric Measurement and Dimension (G-GMD) Explain volume formulas and use them to solve problems</p>	
<p>HS.G-GMD.1. Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.</p> <p>Connections: 9-10.RST.4; 9-10.WHST.1c; 9-10.WHST.1e; 11-12.RST.4; 11-12.WHST.1c; 11-12.WHST.1e</p>	<p>Student Edition: 67-74, 699-703, 798-804, 863-870, 873-879 <i>Concept Summary</i> 875 <i>Key Concept</i> 699, 798, 799, 863, 864, 873, 874 <i>Problem-Solving Tip</i> 865 <i>Test-Taking Tip</i> 865 <i>Watch Out!</i> 864</p> <p>Teacher Edition: AE 68-70, 799, 864-865, 874-875; DI 865, 868; FMC 865; SQ 67, 798, 863, 873</p>
<p>HS.G-GMD.2. Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.</p> <p>Connections: 9-10.RST.4; 9-10.WHST.1c; 9-10.WHST.1e; 11-12.RST.4; 11-12.WHST.1c; 11-12.WHST.1e</p>	<p>Student Edition: 863-870, 873-879, 880-887 <i>Concept Summary</i> 875 <i>Key Concept</i> 863, 864, 873, 874, 880, 882 <i>Problem-Solving Tip</i> 865 <i>Study Tip</i> 881 <i>Watch Out!</i> 864, 881</p> <p>Teacher Edition: AE 864-865, 874-875, 881-883; DI 865, 868; FMC 865; SQ 863, 873; TNT 864</p>

STANDARDS	PAGE REFERENCES
<p>HS.G-GMD.3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. Connection: 9-10.RST.4</p>	<p>Student Edition: 67-74, 863-870, 872, 873-879 <i>Concept Summary</i> 875 <i>Key Concept</i> 863, 864, 873, 874, 880, 882 <i>Mid-Chapter Quiz</i> 872 <i>Problem-Solving Tip</i> 865 <i>Study Tip</i> 881 <i>Test-Taking Tip</i> 865 <i>Watch Out!</i> 864, 881</p> <p>Teacher Edition: AE 68-70, 864-865, 874-875, 881-883; DI 868, 875; FU 868; SQ 67, 873</p>
<p>HS.G-GMD.4. Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects. Connection: ETHS-S1C2-01</p>	<p>Student Edition: 75-77, 647-648, 764-765, 839-844, 845, 846-848, 854-857, 868, 880, 893 #25 <i>Geometry Lab</i> 75-77, 647-648, 845</p> <p>Teacher Edition: AE 840-841; DI 844; FCA 648; FMC 764; FU 868; SQ 839, 880; TT 764, 765; WCG 647, 764</p>
<p>Geometry: Modeling with Geometry (G-MG) □ Apply geometric concepts in modeling situations</p>	
<p>HS.G-MG.1. Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder). Connections: ETHS-S1C2-01; 9-10.WHST.2c</p>	<p>Student Edition: 61-64, 67-74, 75-77, 180-184, 518-523, 540-543, 549-554, 561-564, 570-575, 586-587, 590, 593-596, 612-613, 784, 789, 794, 798-802, 805, 840-842 <i>Geometry Lab</i> 75-77 <i>Key Concept</i> 67, 68, 69 <i>Study Tip</i> 71</p> <p>Teacher Edition: AE 70, 519, 581-582; DI 74; SQ 67</p>
<p>HS.G-MG.2. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). Connection: ETHS-S1C2-01</p>	<p>Student Edition: 797, 868 #27, 877 #29 <i>Geometry Lab</i> 797</p> <p>Teacher Edition: FCA 797; WCG 797</p>

STANDARDS	PAGE REFERENCES
<p>HS.G-MG.3. Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).</p> <p>Connection: ETHS-S1C2-01</p>	<p>Student Edition: 75-77, 180-184, 518-523, 540-543, 549-554, 561-564, 570-575, 580-587, 593-596, 781, 789, 807-814, 845, 850-851, 857, 859-861, 867-868, 877, 879, 883-885</p> <p><i>Geometry Lab</i> 75-77, 895</p> <p>Teacher Edition: AE 519, 581-582; WCG 75</p>
<p>Standards for Mathematical Practice</p>	
<p><i>Students are expected to:</i></p>	
<p>HS.MP.1. Make sense of problems and persevere in solving them.</p>	<p>Student Edition: 48, 79-82, 84-85, 129, 166-167, 201, 230-231, 247, 316-317, 373, 386-387, 434, 454-455, 482, 503, 530-531, 561, 616-617, 675, 690-691, 733, 751, 772-773, 830-831, 865, 908-909, 940, 970-971</p> <p><i>Problem-Solving Tip</i> 48, 129, 201, 247, 373, 434, 482, 561, 675, 733, 751, 865, 940</p>
<p>HS.MP.2. Reason abstractly and quantitatively.</p>	<p>Student Edition: 91-98, 99-106, 107-115, 116, 117-125, 126, 127-134, 136-143, 144-150, 151-159, 546</p> <p><i>Geometry Lab</i> 116, 126, 546</p> <p><i>Key Concept</i> 107, 109, 110, 118, 119, 127, 129, 137</p> <p><i>Postulate</i> 127, 144, 151</p> <p><i>Reading Math</i> 108</p> <p><i>Study Tip</i> 92, 101, 118, 128, 129, 137, 138</p> <p><i>Theorem</i> 129, 145, 152, 153, 154, 155</p> <p><i>Vocabulary Link</i> 94, 101, 102</p> <p><i>Watch Out!</i> 100, 109</p> <p>Teacher Edition: AE 92-94, 100-102, 108-110, 118-120, 128-129, 137-138; FMC 102; SQ 91, 99-100, 107, 117</p>

STANDARDS	PAGE REFERENCES
<p>HS.MP.3. Construct viable arguments and critique the reasoning of others.</p>	<p>Student Edition: 91-98, 99-106, 107-115, 116, 117-125, 126, 127-134, 136-143, 144-150, 151-159 <i>Geometry Lab</i> 116, 126 <i>Key Concept</i> 107, 109, 110, 118, 119, 127, 129, 137 <i>Postulate</i> 127, 144, 151 <i>Reading Math</i> 108 <i>Study Tip</i> 92, 101, 118, 128, 129, 137, 138 <i>Theorem</i> 129, 145, 152, 153, 154, 155 <i>Vocabulary Link</i> 94, 101, 102 <i>Watch Out!</i> 100, 109</p> <p>Teacher Edition: AE 92-94, 100-102, 108-110, 118-120, 128-129, 137-138; FMC 102; SQ 91, 99-100, 107, 117</p>
<p>HS.MP.4. Model with mathematics.</p>	<p>Student Edition: 61-64, 67-74, 75-77, 180-184, 518-523, 540-543, 549-554, 561-564, 570-575, 586-587, 590, 593-596, 612-613, 784, 789, 794, 798-802, 805, 840-842, 850-851, 857, 859-861, 867-868, 877, 879, 883-885 <i>Geometry Lab</i> 75-77 <i>Key Concept</i> 67, 68, 69 <i>Study Tip</i> 71</p> <p>Teacher Edition: AE 70, 519, 581-582; DI 74; SQ 67</p>
<p>HS.MP.5. Use appropriate tools strategically.</p>	<p>Student Edition: 17, 30, 37, 39, 40, 55, 151, 179, 207, 222, 245, 266, 267, 273, 275, 294-295, 323, 334, 494, 670-671, 672-673, 718, 734, 740 <i>Constructions</i> 17, 39, 40, 207, 266, 267, 275, 494, 718, 734 <i>Geometry Lab</i> 55, 245, 273, 323, 334, 670-671, 740 <i>Geometry Software Lab</i> 179, 294-295, 672-673 <i>Postulate</i> 151</p>
<p>HS.MP.6. Attend to precision.</p>	<p>Student Edition: 22-24 <i>Extension Lesson</i> 22-24 <i>Real-World Link</i> 23 <i>Study Tip</i> 22, 23</p> <p>Teacher Edition: FCA 24; TT 22; WCG 22; WO 23, 24</p>

STANDARDS	PAGE REFERENCES
HS.MP.7. Look for and make use of structure.	<p>Student Edition: 25-27, 58, 67-69, 188-189, 206, 303-305, 556-557, 616, 779-781, 789-791, 798-799, 808, 846-848, 854-858, 863-864, 873-875</p> <p><i>Concept Summary</i> 189, 858, 875</p> <p><i>Geometry Lab</i> 206, 556-557</p> <p><i>Key Concept</i> 26, 27, 58, 67, 68, 69, 188, 779, 781, 789, 791, 808, 846, 847, 848, 854, 855, 857, 863, 864, 873, 874</p> <p><i>Study Tip</i> 26, 27, 58, 780</p>
HS.MP.8. Look for and express regularity in repeated reasoning.	<p>Student Edition: 91-98, 99-106, 107-115, 116, 117-125, 126</p> <p><i>Geometry Lab</i> 116, 126</p> <p><i>Key Concept</i> 107, 109, 110, 118, 119</p> <p><i>Reading Math</i> 108</p> <p><i>Study Tip</i> 92, 101, 118</p> <p><i>Vocabulary Link</i> 94, 101, 102</p> <p><i>Watch Out!</i> 100, 109</p> <p>Teacher Edition: AE 92-94, 100-102, 108-110, 118-120; FMC 102; SQ 91, 99-100, 107, 117; TNT 108, 109</p>



MATHEMATICS

ARIZONA ACADEMIC CONTENT STANDARDS