Geometry 2015 Spring Exam Study Guide: $≈$50 questions; multiple choice

**Overall Topics:**

Similarity – Ch 7: Sections 2-6: [Similar polygons, proving similar triangles, proportions, indirect measurement]

Trigonometry: Ch 8: Sections 1-5: [Trig, SohCahToa, using trig to solve problems, Law of Sines/Cosines]

Area: Ch 9: Sections 1-5 [Quadrilaterals, Triangles, Circles, regular polygon area, using trig for area, composite]

Circles: Ch 11: Sections 1-6: [Lines that cross circles, angle/arc measurements in circles, arc length, sector area]

Similarity:

* Set up and solve a simple equation from a ratio problem relating to perimeter: p. 454 ex 2
* Recognize corresponding (matching) parts of similar triangles; then set up and use proportions to find missing values. (Section 7.2) p.463 ex 2B
* Given that two triangles are similar, identify their similarity ratio (section 7.2) and how that impacts their area ratio (ex: if the similarity ratio is 1:4, then the area ratio is 1:16 (similarity ratio squared) (p490 chart, ex 4)
* Determine if two triangles are similar given limited information (use shortcuts): p 471: ex 2, 3
* Set up and solve proportions based on parallel lines crossing through a triangle: p 482 ex2
* Find indirect measurements (heights using similar triangles, shadows, reflections, etc.) section 7.5: p. 488: ex 1; pg 491 #2 (answer: 55ft)
* Given the coordinates of a shape, find new coordinates based on a scale factor: p 495 ex1

**PRACTICE**: p. 458: 20; p.463: 9-10; p. 474: 1,2, 5-8; p. 507: 21, 22, 28,29, 32

Trigonometry:

* Given a right triangle without angle measurements, be able to set up a fraction for sine, cosine, and tangent (p525 ex. 1ABC)
* Use sin/cos/tan to find missing lengths of a right triangle when you have angle measurements (p 527 ex 4ABC)
* Use inverse sin/cos/tan to find missing angle measurements of a right triangle when you have side lengths p 534-5, examples 1 and 3.
* Use right triangle trigonometry to solve application problems: p. 536 ex 5, p540 #67 (answer: A)
* Identify and use angles of elevation and depression with right triangle trig: p. 545 ex 2, 3; p 547 #9
* Law of Sines and Law of Cosines: p 551-4. EXAMPLES: 2AB and 3AB
	+ Remember, if it’s a right triangle, then you can use sin/cos/tan to find missing sides and inverse sin/cos/tan to find missing angles. These laws are primarily used for NON-right triangles (acute or obtuse)
	+ Also remember: Capital A B and C are angles, and lowercase a, b, and c are the sides directly opposite those angles.
	+ If you have a complete pair of known angle measure and known opposite side length, then use the Law of Sines. If you don’t, you need to use the Law of Cosines.

**PRACTICE**: p. 529: 3-8, 18-20; p. 537: 13-15. 33-35. P. 548: 15, 16, 24, 28, 29 p. 555: 26-31, 46-48

Area:

* Given a parallelogram, find height using the Pythagorean Theorem or other means, and then find area. (p589 ex 1A).
* Given area of a parallelogram, find its perimeter. (p 593 #3: ans: 52cm) (p. 593 #11 ans is 1.25m)
* Find the area of a trapezoid (p 590 ex 2A), or given the area of a trap., find one of the bases (ex 2C)
* Given the circumference of a circle, work backwards to find the radius and then the area.
* Find the area of a regular polygon given the number of sides and the side length. (p 602: ex 3AB)
	+ Find the apothem using trig; use A = ½ \* apothem \* perimeter (p 602 CIO#3: ans: 77.3)
* Given a figure that is composed of two or more shapes, find the area (either by adding the different shapes’ areas, or subtracting parts from the whole). pg 606-7, ex1AB and 2AB.
* Use the distance formula to calculate lengths and then use area formulas. (p617 ex 2)

**PRACTICE**: p.593: 4, 7, 23-25 | p 603: 12, 15-17, 28, 43, 44 | p.609: 2-5, 18-20 |p620: 12 | p625: 1-6

Circles

* Be able to identify a chord, secant, and tangent (lines that intersect circles) p. 746 ex 1
* Be able to determine how many tangent lines are shared by two circles (top of p 748)
* Set up and solve an equation involving congruent segments with circles (p 750 ex 4)
* Given a central angle and diameter or radius, find the area of a sector (p 764 ex 1AB)
* Given a radius/diameter and either a central angle or arc measurement in degrees, find the length of an arc (p 766 ex 4AB)
* Determine the angle measurement of a quadrilateral inscribed in a circle (p 775 ex 4)
* Determine the angle measure and/or arc length of an inscribed, interior, or exterior angle.
* Find the measurement of an angle whose vertex is inside/on/outside a circle based on its intercepted arc(s). p 785 chart + ex 5

**PRACTICE:**  p. 810: 6, 11-20, 25-27, 29, 30

*Provided Formulas*

* Law of Sines
* Law of Cosines
	+ You will need to know when/how to use them, but I will give the formulas themselves
* Area of Kite, Rhombus, Trapezoid, Regular Polygon
	+ You will need to know how to find the diagonals or apothems, though

*Formulas to Memorize*

* Similarity Shortcuts that work: AA~. SAS~. SSS~
* Pythagorean Theorem: $a^{2}+b^{2}=c^{2} $where a and b are the legs of a right tri; c is the hypotenuse.
* Trigonometry: SohCahToa, when to use inverses
* Area: rectangle/parallelogram, triangle, circle: base\*height; ½ \* base \* height; π\*radius^2
* Circumference vs Area of Circle: 2π\*radius ; π\*radius^2
* Arc length, sector area of circles: (central angle/360) \* (circumference) ; (central angle/360) \* area
	+ Instead of central angle, can use arc measure if appropriate
	+ Inscribed angle measures; other angle measures in circles: See chart on p. 785