***Geometry***

***Exam Topics: Spring 2014***

Chapter 5: 5.7 and 5.8 only [Pythagorean Theorem and Special right triangles]

Chapter 6: Sections 1-4, 6 [Parallelograms, Rhombi, Rectangles, Squares, Kites, Trapezoids]

Chapter 7: Sections 1-6 [Similar triangles, dilations, proportions]

Chapter 8: Section 2-5 [Trigonometry, “sohcahtoa”, indirect measurement, law of sines/cosines]

Chapter 9: Sections 1-3, 5 [Area: regular polygons, quadrilaterals, triangles, circles, composite figures]

Chapter 11: Sections 1-5, 7 [Circles, angles and segments within circles, arcs and sectors]

Formulas and facts to know going into the test:

* Side relationships in 30-60-90 and 45-45-90 triangles
* Angle sum formula for polygons: *n* sides means (n-2)(180) degrees
* Exterior angle theorem for polygons: (360 in total, no matter number of sides)
* Similarity shortcuts (AA~, SAS~, SSS~)
* Sine (opposite/hypotenuse), Cosine (adjacent/hypotenuse), Tangent (opposite/adjacent) [RIGHT TRIANGLES ONLY]
* Law of Sines and when to use it [non-right triangle, pair of matching side and angle]
* Law of Cosines and when to use it [non-right triangle, no pair of matching side and angle]
* Area and circumference of a circle (A= pi\*radius2 C = pi\*diameter)
* Area of a triangle A = (1/2)\*base\*height
* How to find the central angle of a regular polygon (360/number of sides), how to find the apothem (use tangent of half the central angle)

SPECIAL RIGHT TRIANGLES: p. 356, 358

Find the exact lengths of sides of a 45-45-90 triangle and a 30-60-90 triangle. (p. 356 example 1AB

p. 358 example 3AB)

POLYGONS and QUADRILATERALS

Convex vs concave; regular vs irregular: p 384 ex 3ABC

Parallelograms: chart on p. 392 (diagonals bisect each other, opposite angles and sides congruent)

Rectangles, Rhombi, Squares: Charts and examples on p408-9, square example 410

Rectangles: diagonals same length; rhombus: diagonals cross at right angles and bisect angles; a square is a rhombus and a rectangle and a parallelogram at the same time.

Trapezoid: p. 429 chart, 430 example 2AB

SIMILARITY

Set up 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: p 471: ex 2, 3

Set up and solve proportions based on parallel lines crossing through a triangle: p 482 ex2

Set up and solve proportions based on an angle bisector in a triangle: p 483 ex 4

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, be able to find new coordinates based on a scale factor: p 495 ex1

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 (or “arc”) 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.

Recommended process: Check to see if you have a known angle measure and opposite side length (situated right across from it). If so, then the Law of Sines can help you find what you need. If there is no such pair, then the Law of Cosines applies.

SINES: sin A / a = sin B/b = sin C/c

In other words, take the known angle and opposite length pair and plug them into sin A and a. Then, identify what the question is asking for. If it’s a side, plug the opposite angle in for B. If it’s an angle, plug the opposite side in for (lowercase) b. Cross multiply and solve for the only remaining letter (If it’s an angle, you will need to use arcsine.)

COSINES: relabel the given (or missing, depending on the problem) angle as C. The side directly across from it is therefore (lowercase) c. The other two angles are A and B (doesn’t matter which is which) and their opposite sides are little a and b. Plug in the known values into the formula. If looking for a side length (little c) then all the work can be done in the calculator. If looking for angle C, then you must carefully complete the arithmetic and isolate cos(C). Then , use inverse cosine to find C itself.

AREA: UNDERSTANDING AND USAGE

Given a parallelogram, find its height using the Pythagorean theorem or other means, and then find the area. (p589 ex 1A).

Given the area of a parallelogram, be able to find its perimeter. (p 593 #3: answer is 52cm) (p. 593 #11 answer is 1.25m)

Find the area of a trapezoid (p 590 ex 2A), or given the area of a trapezoid, find one of the bases (ex 2C)

Given the circumference of a circle, work backwards to find the radius and then the area.

Example: Circumference is 24pi. Find the area.

Plug 24pi into circumference formula. 24pi = pi\*diameter . Pi is on both sides of the equation so it cancels out. So that leaves 24 = diameter. If the diameter is 24, then the radius is 12. So plug that into the area formula pi\*radius^2, giving 144\*pi.

Find the area of a regular polygon given the number of sides and the side length. (p 602: ex 3AB)

Will provide alternate formula on formula sheet to avoid finding apothem directly; using tangent from central angle will also work as it has for our previous work with area.

\*Try “Check it out” #3 on p 602. Answer is 77.3cm2.

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)

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

Construct the equation of a circle using a given center and radius (p. 799 ex 1A)

Use the equation of a circle to identify the center coordinates and radius (p 800 ex 2B)