**Geometry – 2nd Semester Study Guide**

* The exam will cover material from chapter 5 & 6, and chapters 8, 10 & 11 in our textbook.
* The exam will be similar in make-up to the chapter tests/quizzes

(multiple choice, completion, short answer)

Please study!

**Chapter 5**

Mid-segment of a triangle

Mid-segment Theorem

Perpendicular bisector

Theorems 5.2 & 5.3

Concurrent lines

Point of concurrency

Theorem 5.4, 5.5, 5.6, & 5.7

Incenter

Median

Centroid

Theorem 5.8

Altitude

Theorem 5.9

Orthocenter

Theorem 5.10 & 5.11

Triangle Inequality

5.12 – Triangle Inequality Theorem

**Chapter 6**

Similar Polygons

Scale factor

Statement of proportionality

Theorem 6.1 (Perimeter)

Angle-Angle Similarity Postulate\*

Theorem 6.2 – SSS Similarity

Theorem 6.3 – SAS Similarity

Theorem 6.4 – Triangle Proportionality

Theorem 6.5 – Converse of 6.4

Theorems 6.6 & 6.7

**Chapter 8**

Diagonal

Theorem 8.1 – Polygon Interior Angles

Corollary to 8.1\*

Theorem 8.2 – Polygon Exterior Angles

Theorems 8.3 & 8.4

Parallelogram

Theorem 8.5 & 8.6

Theorems 8.7 & 8.8

Theorems 8.9 & 8.10

Rhombus

Rectangle

Square

Corollaries on p. 527\*

Theorems 8.11, 8.12, & 8.13

Trapezoid

Kite

Theorems 8.14, 8.15, & 8.16

Theorem 8.17 – Midsegment of Trapezoids

Theorems 8.18 & 8.19

**Chapter 10**

Circle

Center

Radius

Chord

Diameter

Secant

Tangent

Theorems 10.1 & 10.2

Central angle

Minor arc

Major arc

Arc addition postulate\*

Theorem 10.3, 10.4, & 10.5

Inscribed angle

Intercepted arc

Theorems 10.7 & 10.8

Theorems 10.9, 10.10, & 10.13

Segments of the chord

Theorem 10.14, 10.15, & 10.16

**Chapter 11**

Circumference

Arc length

Sector of a circle

Apothem of a polygon

Platonic solids

Volume

Sphere

**AREAS OF FOCUS**

**Chapter 5**

* **Using Properties of Special Segments in Triangles**

|  |  |
| --- | --- |
| **Special Segment** | **Properties to Remember** |
| **Midsegment** | * Parallel to side opposite it and half the length of side opposite it |
| **Perpendicular bisector** | Concurrent at the circumcenter, which is:   * Equidistant from 3 vertices of triangle * Center of circumscribed circle that passes through 3 vertices |
| **Angle bisector** | Concurrent at the incenter, which is:   * Equidistant from 3 sides of triangle * Center of insciribed circle that just touches each side of triangle |
| **Median (connects vertex to midpoint of opposite side)** | Concurrent at centroid, which is:   * Located two thirds of the way form vertex to midpoint of opposite side * Balancing point of triangle (center of mass) |
| **Altitude (perpendicular to side of triangle through opposite vertex)** | * Concurrent at orthocenter * Used in finding area of triangle |

* **Using Triangle Inequalities to Determine what Triangles are Possible**
  + *Sum of lengths of any two sides of a triangle is greater than length of the third side*
  + *In a triangle, longest side is opposite largest angles and shortest side is opposite smallest angle*
  + *If two sides of a triangle are congruent to two sides of another triangle, then the triangle with longer third side also has larger included angle*

**Chapter 6**

* **Using Ratios and Proportions to Solve Geometry Problems**
  + *You can use properties of proportions to solve a variety of algebraic and geometric problems*

For example, in the diagram below, suppose you know that .

You can then write any of these relationships:

* **Showing that Triangles are Similar**
  + *You have learned three ways to prove two triangles are similar:*
    1. *AA Similarity Postulate*
    2. *SSS Similarity Theorem*
    3. *SAS Similarity Theorem*
* **Using Indirect Measurement and Similarity**
  + *You can use triangle similarity theorems to apply indirect measurement in order to find length that would be inconvenient or impossible to measure directly. (like the height of a tree or flag pole based on the lengths of shadows)*

**Chapter 8**

* **Using Angle Relationships in Polygons**
  + *You can use theorems about the interior and exterior angles of convex polygons*

|  |  |
| --- | --- |
| **Polygon Interior Angles Theorem**   * *The sum of the interior angle measure of a convex n-gon is (n – 2)\*180o* | **Polygon Exterior Angles Theorem**   * *The sum of the exterior angle measures of a convex polygon is 360o* |

* **Using Properties of Parallelograms**
  + *Parallelogram – quadrilateral with both pair of opposite sides parallel*
    - *Other properties:*
      * Opposite sides are congruent
      * Opposite angles are congruent
      * Diagonals bisect each other
      * Consecutive angles are supplementary
* **Classifying Quadrilaterals by Their Properties**
  + *List of special quadrilaterals*
    - *Trapezoids*
    - *Isosceles trapezoids*
    - *Kites*
* *Special parallelograms*
  + *Rectangles*
  + *Squares*
  + *Rhombuses*

**Chapter 10**

* **Using Properties of Segments that Intersect Circles**
  + *Several relationships exist between tangents, secants, and chords*
  + *Some help to determine that two chords or tangents are congruent*
  + *Some help finding the length of a secant or chord if the length of related segments is known*
* **Applying Angle Relationships in Circles**
  + *Find the measures of angles formed inside, outside, and on circles*

|  |  |  |
| --- | --- | --- |
| **Angles formed on circles** |  |  |
| **Angles formed inside circles** |  |  |
| **Angles formed outside circles** |  |  |

**Chapter 11**

* **Comparing Measures for Parts of Circles and the Whole Circle**
  + **Arc Length:**
  + **Area of Sector:**
* **Solving Problems Using Surface Area and Volume**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Figure** | **Surface Area** | | **Volume** | |
| **Right Prism** | | **S = 2B + Ph** | | **V = Bh** |
| **Right Cylinder** | | **S = 2B + Ch** | | **V = Bh** |
| **Regular Pyramid** | |  | |  |
| **Right Cone** | |  | |  |
| **Sphere** | |  | |  |