Chapter 7 Topics

**7.1: Ratios and Proportions**

* A **ratio** is a comparison of two quantities by division.
* A **proportion** is an equation that states that two ratios are equal.
* Be able to solve proportions.
	+ **Properties of Proportions**
		- Complete the proportions using the properties of proportions

$$\frac{a}{b}=\frac{c}{d} is equivalent to$$

* $ad=bc$
* $\frac{b}{a}=\frac{d}{c}$
* $\frac{a}{c}=\frac{b}{d}$
* $\frac{a+b}{b}=\frac{c+d}{d}$
* The **Cross Product Property** is “the product of the extremes is equal to the product of the means”
	+ In the statement $\frac{a}{b}=\frac{c}{d}$ the product bc and the product ad are the cross products
		- In that same proportion b and c are the **means.**
		- In the same proportion a and d are the **extremes.**

**7.2: Similar Polygons**

* Two figures that have the same shape but not necessarily the same size are **similar.**
* **Similar Polygons** are two polygons with corresponding angles congruent and corresponding sides are proportional.
* The ratio of the lengths of corresponding sides is the **similarity ratio.**
* Given two similar figures determine the congruent sides and set up proportions

**7.3: Proving Triangles Similar**

* **Angle-Angle Similarity (AA∼)-** If two angles of one triangle are congruent to two angles of another triangle, then the two triangles are similar.
* **Side-Angle-Side Similarity (SAS∼)-** If an angle of one triangle is congruent to an angle of a second triangle, and the sides including the two angles are proportional, then the triangles are similar.
* **Side-Side-Side Similarity (SSS∼)-** If the corresponding sides of two triangles are proportional, then the triangles are similar.

**7.4: Similarity in Right Triangles**

* The altitude to the hypotenuse of a right triangle divides the triangle into two triangles that are similar to the original triangle and to each other.
	+ Corollary 1: The length of the altitude to the hypotenuse of a right triangle is the geometric mean of the lengths of the segments of the hypotenuse.
	+ Corollary 2: The altitude to the hypotenuse of a right triangle seperates the hypotenuse so that the length of each leg of the triangle is the geometric mean of the length of the adjacent hypotenuse segment and the length of the hypotenuse.
* For any two positive numbers, a and b the **geometric mean** of a and b is the positive number x such that $\frac{a}{x}=\frac{x}{b}$. Note that $x=\sqrt{ab}$

**7.5: Proportions in Triangles**

* **Side-Splitter Theorem:** If a line is parallel to one side of a triangle and intersects the other two sides then it divides those sides proportionally.
	+ **Corollary-**If three parallel lines intersect two transversals, then the segments intercepted on the transversals are proportional.
* **Triangle-Angle Bisector Theorem:** If a ray bisects an angle of a triangle, then it divides the opposite side into two segments that are proportional to the other two sides of the triangle.

Given various scenarios be able to use theorems to solve for side lengths.

Practice Problems

* **Checkpoint Quiz 1** Page 379 #1-10 all
* **Checkpoint Quiz 2** Page 440 #1-10 all
* **Chapter Review** Page 407-409 #1-2, 4-5,8-38 all
* **Chapter Test** Page 410 #1-24 (skip #22)
* **Extra Practice** Page 728-729 #1-30 all (skip #29)