Unit 4 Notes

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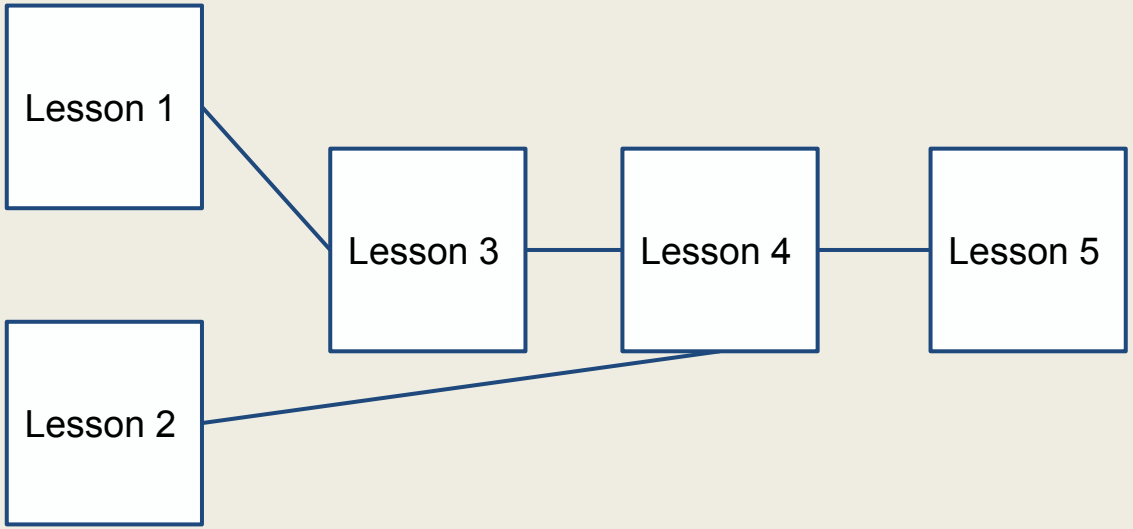
Lesson Path



Lesson 1

Lesson 1 mainly focussed on the hinge and converse hinge theorems, and more importantly how they help us determine the largest and smallest angles and sides in triangle. We were told that the largest angle in a triangle is included between the two shorter sides, and the smallest angle in the larger sides. In triangles with shared lengths, we can find a range of measures for sides/angle, based on the largest and smallest sides/angles found using hinge theorem. This ties into lesson 2 in no way, because 2 introduces a new prerequisite for lesson 4.

Lesson 2

Lesson 2 is about radicals, or square roots, particularly, how to simplify them. For example, radical 9 is the same as radical 3 times radical 3. Essentially, radicals can be multiplied and divided like regular numbers, and is almost like a variable, in that radical 3 times 2 is 2 radical 3. We learned that the expression under the vinculum is called the radicand. We learned that simplifying a radical like radical 108 is simple, if you know the prime factors. The smallest prime numbers that multiply to get 108 are 3*3*3*2*2, and since we have a pair of 2s and 3s, we can take them out of the radicand and write 2*3 on the outside. We would now have 6 radical 3 in simplest radical form. After the main radical properties, we combine this knowledge with lesson 1's and 3's to do lesson 4.

Lesson 3

Lesson three follows the concepts of lesson 1, and teaches forms of the Pythagorean Theorem. The main ones are the converse of the Pythagorean Theorem and the Pythagorean Inequalities Theorem. The Converse of the Pythagorean Theorem simply states that if $c^2 = a^2 + b^2$, the triangle is right. The Pythagorean Inequalities Theorem just says if the longest side squared is greater than the sum of the shorter sides squared, the triangle is obtuse, and if the sum of the shorter sides squared is greater than the longest side squared the triangle is acute. This ties in to the 4th lesson, which is about special right triangles, where you need to know if the triangle is right or not.

Lesson 4

Lesson 4 is over special right triangles. The two types of special right triangles discussed are 30-60-90 and 45-45-90.
The shortest side of a 30-60-90 triangle (across from the 30 degree angle) is the most important side to know. The longer leg (across from the 60 degree angle) is the length of the short side times radical 3. The hypotenuse is simply double of the short side.
45-45-90 triangles are isosceles right triangles, and all isosceles right triangles are 45-45-90. The 45 degree angles form two congruent sides. The hypotenuse is the length of either side times radical 2.
Lesson 4 and the other lessons all tie into lesson 5, the application of all learned concepts.

Lesson 5

Lesson 5 mainly focuses on potential applications for all of the learned concepts. Nothing much more than that, but it taught us application from bridges to treehouses. Overall, we invested more time in triangles, particularly right triangles, in the 4th Unit.