The History of Euclid

Long ago, there was a Greek mathematician named Euclid. He was a curious man in that he loved to read and study the works of earlier mathematicians. He decided one day to venture into the land and create a single, logically coherent framework of all the past mathematicians, making it easy to use and easy to reference....

Today, we will venture with Euclid into his establishment of **The Elements**. He first thought that there should a set of rules.. guidelines... axioms, that needed to be established.

Tools you can only use

1. A compass

2. A Straightedge (a ruler with no numbers or units)

Things you can create

1. You can always draw a straight line from any point to any point

2. You can extend a finite straight line (segment) continuously into a straight line

3. You can create a circle with any given segment using a compass

Rules you must follow

1. All right angles are equal to one another

2. Parallel lines do not intersect

3. Things that are equal to the same thing are also equal to one another

4. Things which coincide with one another are equal to one another

5. The whole is greater than the part

This is where our story begins... Euclid first met a man named Alpha. Alpha had a problem, he wanted to create an equilateral triangle, but he did not know what was the best way to do so. Using your compass and straightedge, and given a finite straight line (a segment) from Alpha, can you help Euclid and Alpha construct an equilateral triangle (where one side is the segment)? (Remember to follow the rules).

As Euclid traveled into the heart of Greece, he met a young woman named Beta. Beta asked Euclid if he was given a segment and any point, was there a way that he could construct that segment on the given point? Using your knowledge from when Euclid met Alpha, can you help Euclid answer Beta's question?

Several days later, Euclid met a child named Gamma. Gamma had two unequal sticks, and asked Euclid if there was a way to cut the bigger one so that it is equal to the smaller one. With the knowledge of meeting Alpha and Beta, can you help Euclid?

Euclid then traveled into the land of Angles and was approached by Delta on a question of comparing two triangles. Delta asked Euclid, "If two triangles have the two sides equal to two sides respectively, and the angles contained by the equal straight lines are equal, how do I know that the base of the two triangles are equal? If they are, does that mean that the two triangles are equal?" Can you help Euclid answer Delta's question?

Upon hearing of Euclid's arrival, Isosceles went to seek Euclid's help. He asked Euclid, "My triangle has two sides equal to one another. Are the angles at the base of my triangle equal to one another, and if the equal straight lines are extended, will the angles under the base be equal to one another as well?" Can you help Euclid answer Isosceles' question?

After helping Isosceles, Euclid met his son, Epsilon. Epsilon has studied greatly with his father in answering his questions. However, he has always pondered on a question that had troubled him for years, he then asked Euclid if he could help. Epsilon asked, "If in a triangle, two angles are equal to one another, what can I say about the two sides that subtend the equal angles? Will they be equal?" Help Epsilon in answering his question from the knowledge Euclid gained from helping Isosceles.

After meeting so many people, Euclid pondered a question himself about triangles. Given two straight lines constructed on a straight line and meeting at a point, can Euclid construct two more straight lines, on the same side, meeting at another point but whose length are equal to the two given lines?

In the land of Greece, there are also magical creatures. Euclid met one of the many legendary creatures in a forest. It was a slithering snake. He would not let Euclid pass through the forest until Euclid can answer one of his many riddles. "SSS," hissed the snake, "If two triangles have the two sides equal to two sides respectively, and their bases are equal, what can I say about the angles of the triangle? SSS." Can you help Euclid answer the snake's riddle and escape the Forest of Angles?

Among the magical creatures, there was one that was feared by most Greeks, his name was Biclops. Biclops was always seen in rage and destroying everything. Euclid asked Biclops what he can do to help. Biclops wanted to know, given an angle, how can he bisect it? Also, given a finite straight line, how can one bisect it? Can you help Euclid with all the knowledge he has gained in his travel to answer Biclops' questions?

Euclid's journey did not end there for he were to meet many more foes and make many friends. You can find his journey in his memoirs, called **The Thirteen books of the Elements**.