

SE: Take the Ancient Greek Challenge

The study of Geometry was born in Ancient Greece, where mathematics was thought to be embedded in everything from music to art to the governing of the universe. Plato, an ancient philosopher and teacher, had the statement, “Let no man ignorant of geometry enter here,” placed at the entrance of his school. This illustrates the importance of the study of shapes and logic during that era. Everyone who learned geometry was challenged to construct geometric objects using two simple tools, known as Euclidean tools:

- A straight edge without any markings
- A compass

The straight edge could be used to construct lines; the compass to construct circles. As geometry grew in popularity, math students and mathematicians would challenge each other to create constructions using only these two tools. Some constructions were fairly easy (Can you construct a square?), some more challenging, (Can you construct a regular pentagon?), and some impossible even for the greatest geometers (Can you trisect an angle? In other words, can you divide an angle into three equal angles?). Archimedes (287-212 B.C.E.) came close to solving the trisection problem, but his solution used a marked straight edge.

We will use a protractor and marked straight edge (you know it as a ruler) to draw some geometric figures.

What “constructions” can you create?

Your 1st Challenge:

Draw a regular quadrilateral.

Your 2nd Challenge:

Draw a quadrilateral with no congruent sides.

Your 3rd Challenge:

Draw a circle. Then draw an equilateral triangle and a square inside so that both figures have their vertices on the circle (inscribed).

Your 4th Challenge:

Draw a regular hexagon. Then divide it into three congruent quadrilaterals

Your 5th Challenge:

Draw a regular octagon. Then divide it into two congruent trapezoids and two congruent rectangles

Your 6th Challenge:

Draw a triangle with side lengths of 5, 6, and 8 units.

Your 7th Challenge:

Draw a triangle with an obtuse angle.

Your 8th Challenge:

Draw an equilateral right triangle.

Your 9th Challenge:

Create some challenges of your own and pose them to a classmate.