

# Archimedes

287 - 212 B.C.E.

Archimedes is known as one of the three greatest mathematicians of all time, along with Newton and Gauss. He was known by many as "the wise one." Others referred to him as "the master." However, he was most well known as "the great geometer."

Archimedes probably got his interest of mathematics from his father, Phidias, who was an astronomer. He was so interested in solving problems, that it more or less became his hobby. It was said that he was consumed with solving problems, that he often times forgot to eat. His real hunger was to learn as much as he could about mathematics. This led him to be a student in Euclid's school, to further his mathematical knowledge.

His fascination with solving problems, anywhere or anytime, made for some interesting stories. It was said that he would draw in dust, dirt, or whatever was available. He was also known for his drawing of geometric problems on his stomach with olive oil.

Archimedes' fame came from his relationship with Hiero, the king of Syracuse. He spent most of his time trying to solve problems for the king. His most well known solution was in regards to the golden crown. King Hiero was worried that the metalist who was making him a golden crown was replacing some of the gold with another metal. King Hiero called upon Archimedes to find a way to see if the crown was made of pure gold or a combination of metals. Archimedes came upon the solution on how to prove this as he was taking a bath. Upon entering a full tub of water, he noticed that the weight of his body displaced a certain amount of water. Knowing that this same principle could be used on the crown, he forgot himself with excitement. He jumped out of the tub and ran naked through the town, yelling "Eureka, Eureka."

Archimedes once made the statement, "Give me a long enough lever and a place to stand, and I will move the earth." After this statement, King Hiero asked him to prove it. This challenge was in regards to a huge ship in the harbor that couldn't be launched by all the men of Syracuse. Archimedes launched the ship with the help of a large lever, proving his statement.

Some of his other inventions were the watering screw, and the miniature planetarium. However, his theoretical work was his main calling. The work with levers and pulleys helped make things easier. The discovery of the displacement of water in the bath tub led into hydrostatics. He also did work in integral calculus and work on pi.

King Hiero came to Archimedes to get help in developing weapons to fight the Roman general Marcellus, who attacked Syracuse by both land and sea. To stop the attacking soldiers. Archimedes invented the catapult. This hurled 500 pound boulders at the advancing soldiers. To stop the invasion by sea, he invented large claws that picked up Marcellus' ships, lifted them out of the water, and smashed them against the rocks. The ships that weren't close enough to capture with claws were destroyed by another

invention. Mirrors were used to magnify the sun's rays to catch the enemy ships' sails on fire, destroying much of their fleet.

All of these inventions scared the Romans and made it difficult to capture Syracuse.

After eight months, Marcellus finally managed the siege. The capture of Syracuse led to Archimedes' demise. Marcellus sent a Roman soldier to find Archimedes. He was found and killed, ending the life of one of the world's greatest mathematical minds. There are many different accounts of Archimedes' death, but the most believable are the following:

1. Archimedes was unaware of the taking of the city, as he was intent on working on a problem by drawing figures in the dust. As the soldier came to capture him, he stepped in the dust where Archimedes had been working. Archimedes said, "Don't disturb my circles." This made the soldier so mad that he drew his sword and slew him.
2. A soldier found Archimedes and told him to follow him to Marcellus. Archimedes declined to follow him until he finished his problem. This enraged the soldier, so he drew his sword and killed him.
3. While Archimedes was working, a soldier came to take him away to Marcellus. He started dragging him away from his work. Archimedes proceeded to tell the Roman "Stand away from my diagram." As the soldier pulled him away, Archimedes turned and noticed that he was a Roman. He cried, "Someone give me one of my engines." This scared the Roman so much that he drew his sword and killed him.
4. When the soldier came to kill Archimedes, he asked the soldier to wait and allow him to finish the problem he was working on. The soldier, unmoved by the request, was angered to draw his sword and kill Archimedes.
5. Archimedes was carrying mathematical instruments, dials, spheres, and angles to Marcellus. A soldier saw him and thought he was carrying gold in a vessel. He killed him for the gold.

One thing that all the stories tell is that Archimedes was killed at the hands of one of Marcellus's soldiers. When buried, Archimedes had a tombstone with the figure of a sphere inscribed in a cylinder. They had the 2:3 ratio of volume between them, which he was famous for.

