



Archimedes

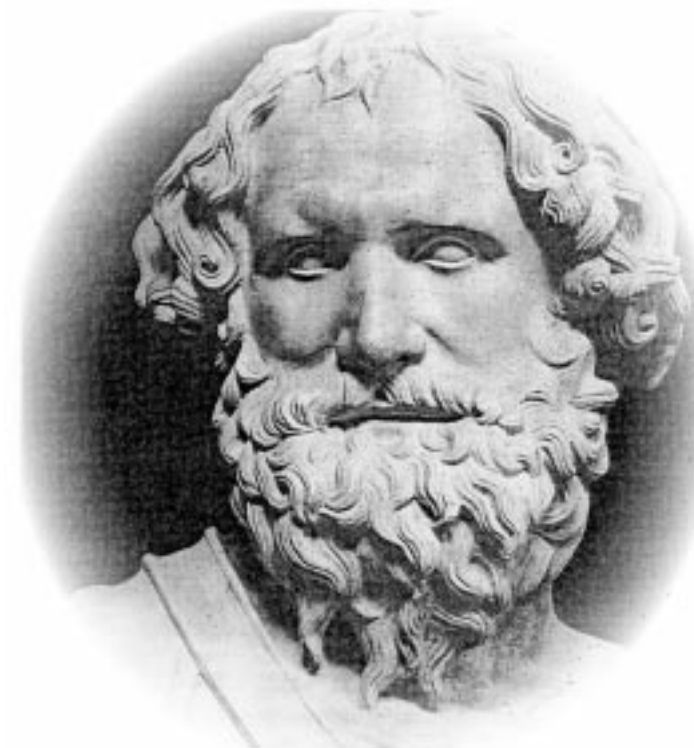
287 - 212 B.C.

Archimedes is probably the most famous ancient Greek mathematician, inventor and astronomer. The year of his birth is usually stated to be 287 B.C. He was born in Syracuse, Sicily, then a Greek colony. According to one version he was poor and of humble birth, but the ancient historian Plutarch reports on his family connection and his intimate relation with King Hieron II of Syracuse.

He spent some time in Alexandria studying mathematics, and most probably visited Spain, but he spent most of his life in Syracuse under the patronage of King Hieron.

Archimedes discovered the relation between the areas and volumes of a sphere and its circumscribing cylinder. He is also known for his formulation of the hydrostatic principle, known as **Archimedes' Principle: the upthrust on a submerged body is equal to the weight of fluid displaced**. He designed all sorts of pumps, and **the Archimedean water-screw** is still widely used.

War machines of his construction greatly delayed the capture of Syracuse by Roman forces in 212 B.C. Powerful machines discharged heavy blocks of stone from a distance on the Roman legions; however, Syracuse was finally captured by the Roman general Marcellus and Archimedes was killed. In one of the versions of his death he was ordered by a soldier to follow him to Marcellus; Archimedes refused to do so until he had finished the problem that he was studying, upon which the soldier became enraged and killed him. According to another version, Archimedes, while intent on some figures he had drawn in the dust, was killed by a soldier who did not know who he was.



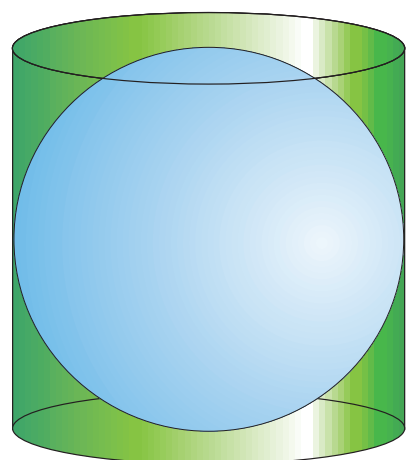
'Give me a place to stand and I will move the Earth'
(Archimedes)

Plutarch tells us that there seldom lived anyone who was so much preoccupied with mathematics, '*... he forgot to nourish himself and omitted to care for his body, and when, as would often happen, he was urged by force to bathe and anoint himself, he would still be drawing geometrical figures in the ashes or with his finger would draw lines on his anointed body ...*'.

Many details survive about the life of Archimedes but they are largely anecdotal, reflecting the popularity of the genius inventor. Examples are the stories that he used a huge array of mirrors to burn the Roman ships besieging Syracuse and that he said, '*Give me a place to stand and I will move the Earth*', after he had found how a very small force is capable of moving a very large weight with the help of levers. The story that he determined the proportion of gold and silver in a wreath by weighing it in water is probably true but the version that has him leaping from the bath in which he got the idea of his 'Principle' and running naked through the street shouting: '**Eureka!**' (I have found it!) is not to be taken seriously.

In antiquity, Archimedes was also known as an outstanding astronomer: his determination of solstices (the days of maximum daylight or night-time hours) were used by other ancient astronomers.

S.E.



$$V = \frac{4}{3} \pi r^3$$

$$A_s = 4 \pi r^2$$

$$V_{\text{cyl}} = 2 \pi r^3$$

Archimedes discovered his 'Principle' (perhaps !)

Eureka !

