Life and death of archimedes

History

The Number 20 March Archimedes The life story of Archimedes takes a modern reader to an exciting journeyinto " the genius of Hellenic learning" (Roller quoted in Jaeger 235). Indeed, there cannot be found a single word to describe the genius of Archimedes – one of the greatest scientists of antiquity. He has earned his fame as " the father of mathematics" (Hasan 1), but he has been equally celebrated as a philosopher, engineer, physicist, astronomer, and inventor. Jaeger in her research " Archimedes and the Roman Imagination", compares Archimedes to Albert Einstein, stating he was " a symbol of intellect" known and respected by many and understood by few (Jaeger 7). My goal in this paper is to explore the biography of Archimedes and find out what the historical significance of his work is. The paper starts with the introduction. Then it focuses on the facts that highlight the major points in Archimedes' life. Next, it defines the historical significance of Archimedes' contribution into various spheres of science and human life. The paper ends with conclusion that summarizes the major points discussed. Life and Death of Archimedes Little is known about the life and death of Archimedes. Supposedly, he was born c. 287 BC in the city of Syracuse on Sicily (Jaeger 2). The territory was a part of Greece at that time and was ruled by King Hieron II, to whom Archimedes was said to be related (Mobile Reference, " Archimedes"). In a preface to one of his works, The Sand Reckoner, Archimedes mentioned that his father Phidias was an astronomer. Archimedes is believed to have studied in Egypt. In particular, he is thought to have studied in Alexandria-based mathematic school that was founded by Euclid, a prominent Greek mathematician. Later, Archimedes is known to have returned to Syracuse, where he met his death during the Second Punic War. This allegedly happened c. 212 BC. At that time the

Roman forces led by the general Marcellus (c. 268 BC –208 BC) attacked the city of Syracuse and finally took it. Archimedes was killed after Syracouse surrendered and Roman troops filled the city. According to the ancient author Tzetzes, he was about 75 years old when it happened (Jaeger 2). Allegedly, Archimedes med his death in the following way. Just as the Roman soldiers started looting Syracuse, the great mathematician was at home attempting to solve one of the mathematical problems. As Plutarch says, he was so deep in thought and so concentrated on what he was doing that he hardly noticed anything around him (Hasan 85). So when one of the Roman warriors walked in and stepped on some of the figures drawn in the dirt, Archimedes allegedly cried: " Don't disturb my circles!" This eventually cost him life (in other accounts he is said to have refused to accompany the soldier to the general Marcellus until the problem had been solved). Anyway, Marcellus was quite furious when he learned about the death of Archimedes, whom he had invited to his place to converse in a friendly manner. It is also believed that Marcellus ordered the execution of that soldier who killed the mathematician on the ground that the former had to be dealt with as a common murderer (Hasan 86). Historical Significance of Archimedes' Discoveries and Inventions In his lifetime, Archimedes was probably most famous for his military inventions. At the time of the Second Punic War, the catapults designed by Archimedes were used by his countrymen to force back the enemy's troops on land. Historical sources also provide evidence that Archimedes found the way to set Roman vessels on fire thanks to the specific arrangement of mirrors (Mobile Reference, " Archimedes"). The device known as " heat ray" focused sunlight on the ships that approached the shore and made them catch fire. Modern experiments have proved that

the use of heat ray could have been a practice during the siege of Syracuse. During the First Punic War, the odometer was used – another military invention by Archimedes. The odometer, as described by historians, was a cart that had a gear mechanism. After a mile of travelling, the mechanism dropped a ball into a special container (Mobile Reference, " Archimedes"). The claw of Archimedes was one more military invention by the great scientist which needs to be mentioned. It was made of an arm resembling a crane with a big metal hook. When the ship started its attack, the arm was put to motion and swung upwards. So the ship got lifted and eventually sunk. In the sphere of mathematics, Archimedes applied the method of exhaustion in order to calculate the definite area under what is known as the arc of a parabola. Next, he effectively used infinitesimals in his calculations. His technique is very close to the integral calculus method which has been developed only recently. Also, he calculated the remarkable accurate value of pi (Mobile Reference, " Archimedes"). Furthermore, Archimedes provided a definition of a spiral which was named after him. He calculated possibly the earliest known example of what came to be known as a geometric progression (Mobile Reference, " Archimedes"). Also, he devised a unique system for large numbers expression along with finding formulae for calculating the surfaces of revolution. In the realm of physics, Archimedes is credited with inventing a lot of things that were used throughout the upcoming centuries. For instance, he was an inventor of a screw pump, a variety of siege engines, as well as an author of the ideas of the lever and pulley. He also advanced the foundations of hydrostatics and developed the principles of statics (Fox et al 76). Importantly, the famous " Eureka!" story relates to Archimedes discovering what would come into history as the

Archimedes' Principle. It states that the displaced fluid's weight is directly proportional to the displaced fluid's volume (Rorres, " The Golden Crown"). Known as a law of buoyancy, it says that the object's buoyant force will be equal to the displaced fluid's weight. It also equals the fluid's density being multiplied by the volume that was submerged times the constant g (the gravitational one). In the field of astronomy, Archimedes developed and put to writing a sketch of what came to be known as a planetarium. Remarkably, to do this the scientist allegedly used the knowledge of what is called " differential gearing" today (Mobile Reference, " Archimedes"). Conclusion As it has been illustrate above, the inventions and discoveries of Archimedes were all genial for his time. They laid the foundations of important directions in science, considerably developed mathematics, and were used to improve the everyday life of people in the generations to come. During his lifetime, the inventions and discoveries by Archimedes helped his countrymen defend their native city when two Punic wars took place. But for many of his inventions and discoveries, the modern science would not have reached its level of theoretical thought. Therefore, Archimedes' title as the father of modern mathematics has been used rightfully. Appendix. Archimedes Portraits