Mathematics in Ancient Art

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Abstract
According to the Cambridge Dictionary, mathematics is the study of numbers, space, and shapes through a system of symbols. Similar to this painting are also a visual representation of presenting shapes, space and objects on paper. Mathematics has been used for thousands of years to create amazing art, scientific discoveries and more. However, some people view mathematics as a tool that can be applied in any context. Others believe that mathematics is simply a tool and nothing more. The body paragraphs of this analysis will address the role of mathematics in art and science, the benefits of using mathematics, and the relationship between mathematics and ancient art. Mathematics is all around us, in this high-tech era. But there are many instances of mathematical figures and formulas used in ancient paintings. As per the day, we tend to believe arts and mathematics are two different areas to work upon, but ancient paintings contradict this ideology to a great extent. The pattern and forms used in ancient paintings have the accurate usage of advanced mathematics.

Keywords: Mathematics applications, mathematics in art, ancient art , golden ratio, maths in sculptures , Leonardo Di Vinci's art, golden ratio of Mona Lisa

Introduction
"While mathematics can assist in the aesthetic appeal of visual art, visual art is able to depict mathematical concepts in an elegant and effective manner."
In the past, mathematicians were artists first and foremost. They created beautiful artwork by using all their mathematical knowledge. Plus, they were able to create incredibly intricate designs. For example, Leonardo da Vinci drew incredibly intricate designs in his notebooks. These designs help us understand how gravity works and how the human body works. On top of that, he was able to use his knowledge of these designs to create new forms of art. This is why mathematics is so important- it allows us to create art that would otherwise be impossible. Before the significant division between arts and mathematics in the current education and professional system. When we rewind to ancient art and heritage, we find astonishing patterns inculcated in painting by those who probably don't know anything about mathematics laws or terms as we do now. Still we separate mathematics from illustrations, in spite of having ample of significant ancient painting to contradict this thought.
Mathematics is boring and doesn't inspire artists. Some people believe that there's no need for art when they have everything they need through mathematics. Instead, they prefer to focus on other things like music or literature instead. They also believe that math is too complicated to be useful in everyday life, which makes it less interesting than art.

First Case Study
Mathematics and Art combination is proven to be the world's biggest attraction, Leonardo Di Vinci's famous painting "Mona Lisa", is known and famous for not only its one-of-a-kind artwork by the great painter. But also for how incredibly he included the *Golden Ratio* in the face of Mona Lisa, which let her one of the greatest assets of artwork in the history of Humankind.
The golden ratio is represented by the Greek letter "φ" (phi), and specialists and designers have been utilizing its imagination arms stockpile.
The Brilliant proportion, as a rule, is a number gotten by separating bigger amounts from the more modest ones. A bigger amount/Numerator is conspicuously an amount of two amounts, while a more modest amount/Denominator is a more modest single amount.
The worth of the whole number is 1.618. The most natural and simple way is to exhibit through the Fibonacci Series. Greek utilized Brilliant proportions to help their superb compositional designs supported by Square shapes, Squares, and Twistings.
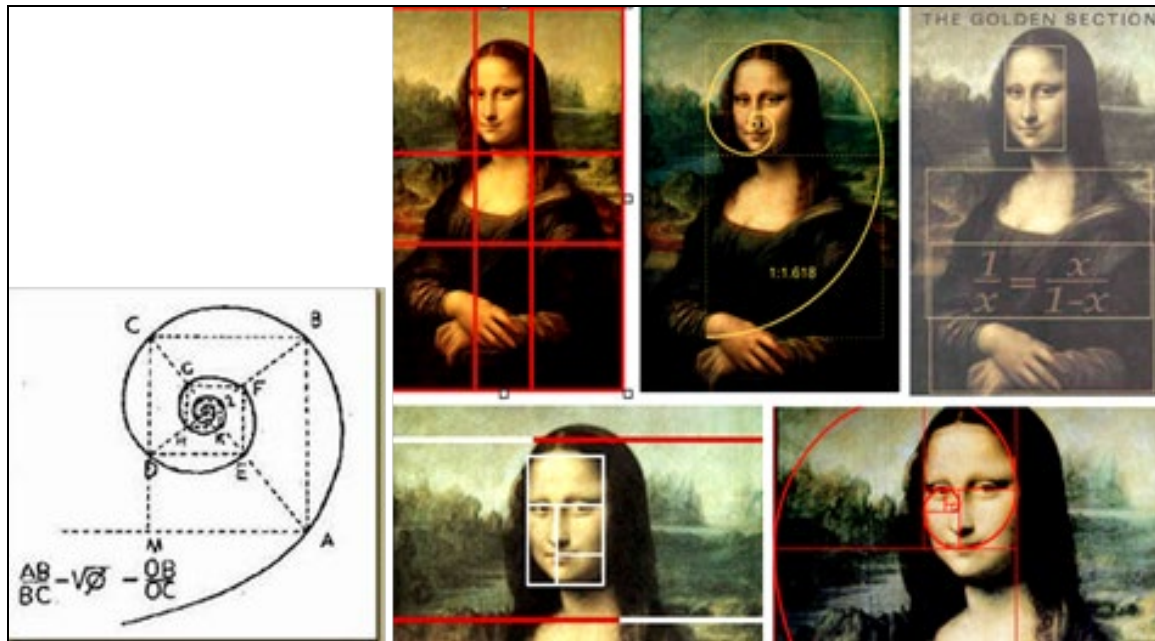
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< 53 >

Fig 1: Golden Ratio and Its use in Mona Lisa Portrait

Mathematics can be applied anywhere, and Mona Lisa's celebrated success can be attributed to the Golden Ratio, which makes her face absolute proportional and attractive.

At a time when mathematics did not advance and humans were unable to explore theories and theories, utilizing mathematical principles with such precision is an exceptional accomplishment.

Second Case Study

The Ancient Greeks were renowned for their artistic and technical skills. They created many works of art using mathematics, such as architecture and sculpture. They also used geometry to create works of art such as vases, columns and bas-reliefs. They also measured distances and weights with great precision. Their artwork has greatly influenced modern art and technology.

Ancient Greek mathematicians used mathematics to create realistic paintings and sculptures. They used geometry mostly to create human figures. They used vectors and proportions to create accurate and life-like sculptures. They also used algebra to create diagrams that explained their formulas. They did all this in order to impress the public with their artistic skills. They succeeded in doing so, since their work is still admired today. They used geometry to create a wide range of artistic and structural stimuli. They used it to create huge monuments such as the Parthenon in Athens and the Colossus of Rhodes. They also used it to create smaller art pieces such as vases, cups and jewelry. They even used it to create mathematical tables for food storage and organization. They did all this in order to impress the public with their artistic skills. They succeeded in doing so, since their work is still admired today.

There are a number of great examples of mathematics in ancient historical paintings, such as those by Polykleitos.
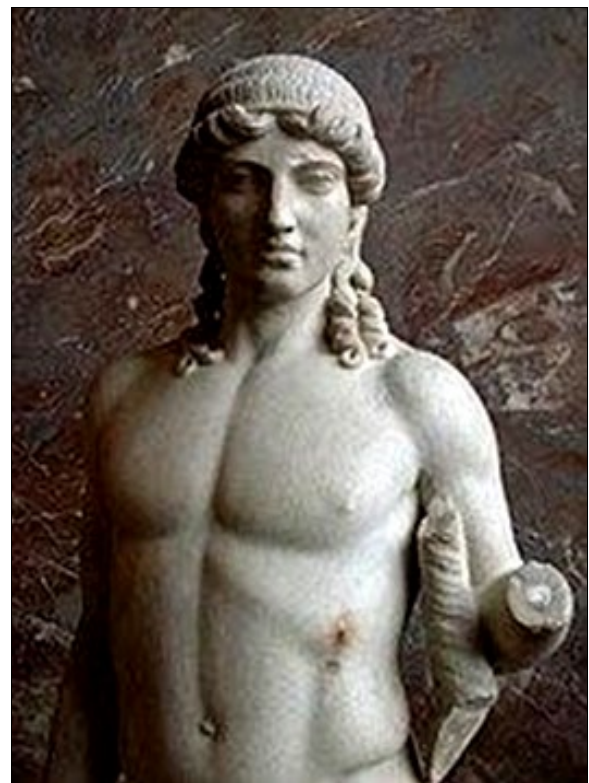

Fig 2: Ancient Greek sculpture

Polykleitos is regarded as the Best Sculptor of the humankind and considered one of the most important sculptors of classical antiquity. He mostly made sculptures depicting men in sports.

He used mathematical proportions and standards in his famous creation "Canon", as depicted in figure 3.
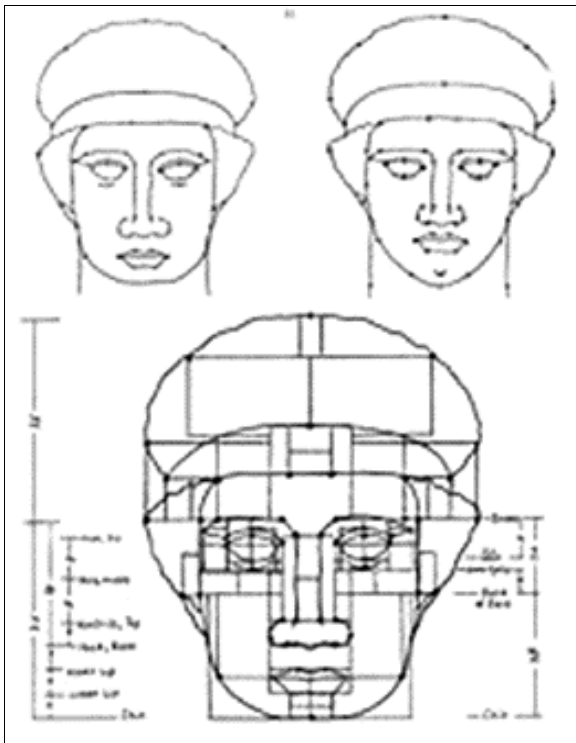
< 54 >

Fig 3: The Polykleitos's Canon

Certain ancient Greek sculptures and paintings used mathematics to create the desired effect. For example, the Parthenon contains numerous depictions of the Pythagorean Theorem; this uses mathematics to calculate the length of the diagonal of a square grid. Another example is the Nike Statue at Olympia, Greece. This statue featured calculations on its base that accurately scaled up to 6 bases (pairs of steps) tall. This allowed the monument to impress viewers while also commemorating a specific number-related measurement scale.
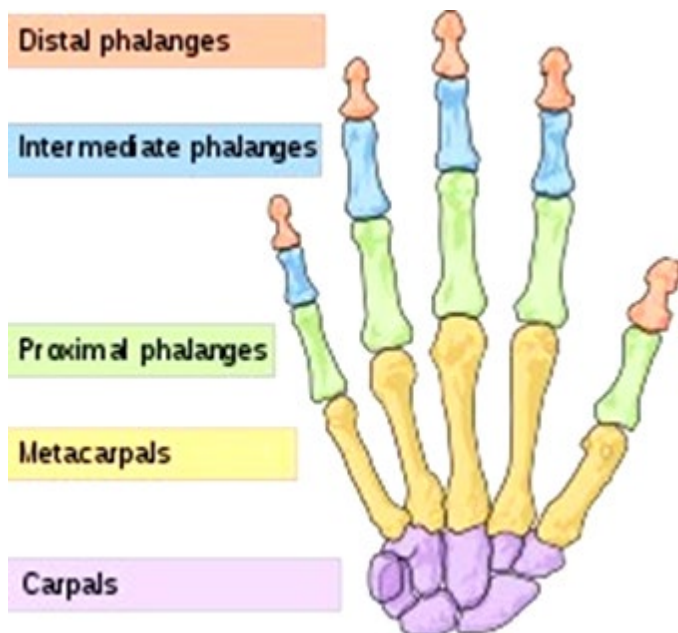

Fig 4: The measurement used by ancient Greek sculptures in hands

Conclusion
Artistic techniques such as these have shaped our culture since the Ancient Greeks first pioneered them thousands of years ago. Many people still admire their artistic skills, which have been greatly influenced by mathematics and geometry.

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On one hand, some people view mathematics as a tool that can be used in any context. However, others view it as an artistic tool that allows us to create amazing works of art and science. Ultimately, mathematics is an integral part of humanity's history because it has had so many positive effects on our lives.

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< 55 >