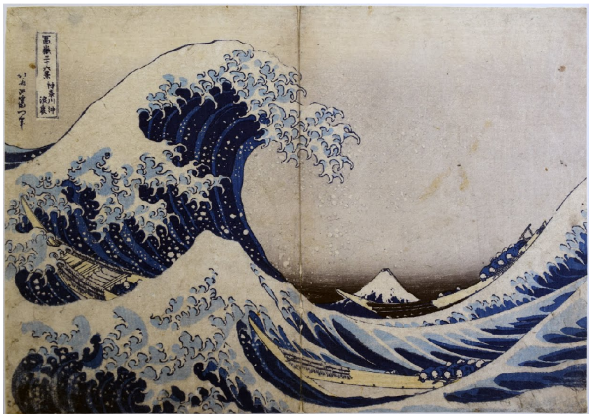
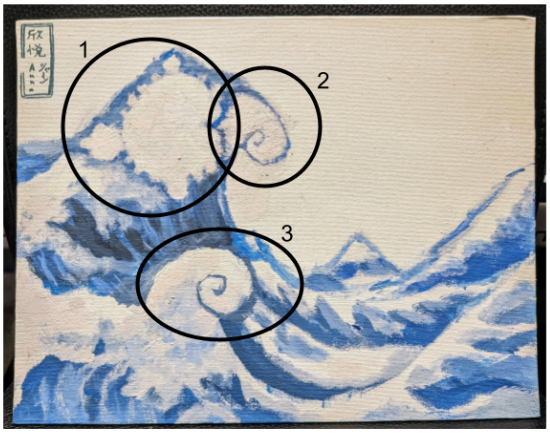
Math in Art Project 2: The Great Wave off the Coast of Kanagawa



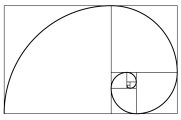
The image on the left above is the original painting we chose, The Great Wave off the Coast of Kanagawa by Katsushika Hokusai. The image on the right above is our club's recreation of the painting. Our art was created on a 11"x14" canvas. We used acrylic paint for the painting of waves, and we used markers for the writing at the top left corner of the drawing to better capture the style of the original painting.

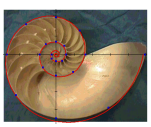
One math element we used in our art recreation is the Mandelbrot Set. In circle number one on the picture at bottom right, we feature a silhouette of the Mandelbrot Set in white against blue. The Mandelbrot Set is a fractal, meaning that the whole set will repeat as you zoom in. It is described as the set of numbers in the complex plane given complex number c: $f_c(z) = z^2 + c$ does not go to infinity when iterated ($f_c(0)$, $f_c(f_c(0))$ stays finite. Each point is plotted as (z, c).

Another math element we used in our art creation is the golden ratio. In circle number two and three on the picture at bottom right, a spiral is presented. "This ratio was named the golden ratio by the Greeks. In the world of mathematics, the numeric value is called "phi", named for the Greek sculptor Phidias" (source: The Golden Ratio). It is also related to the Fibonacci Sequence, as dividing later terms will approach the golden ratio: $\phi = \frac{1+\sqrt{5}}{2}$, which is about 1.618033989. For example, if we take the 101st term of the Fibonacci Sequence and divide it by the 100th term, we get a value of around 1.618033989, which is around the same value as the golden ratio. Similarly, if we take the 11th value, 89, and divide it by the 10th value, 55, we get a value of about 1.6181818181818. This value is also close to the golden ratio, but not as close as when we used the 100th and 101st values.



In real life, we see the golden ratio in various places, such as plants and shells:





golden ratio golden ratio in plants golden ratio in shells

Courtesy: Image from Internet and source links are embedded.