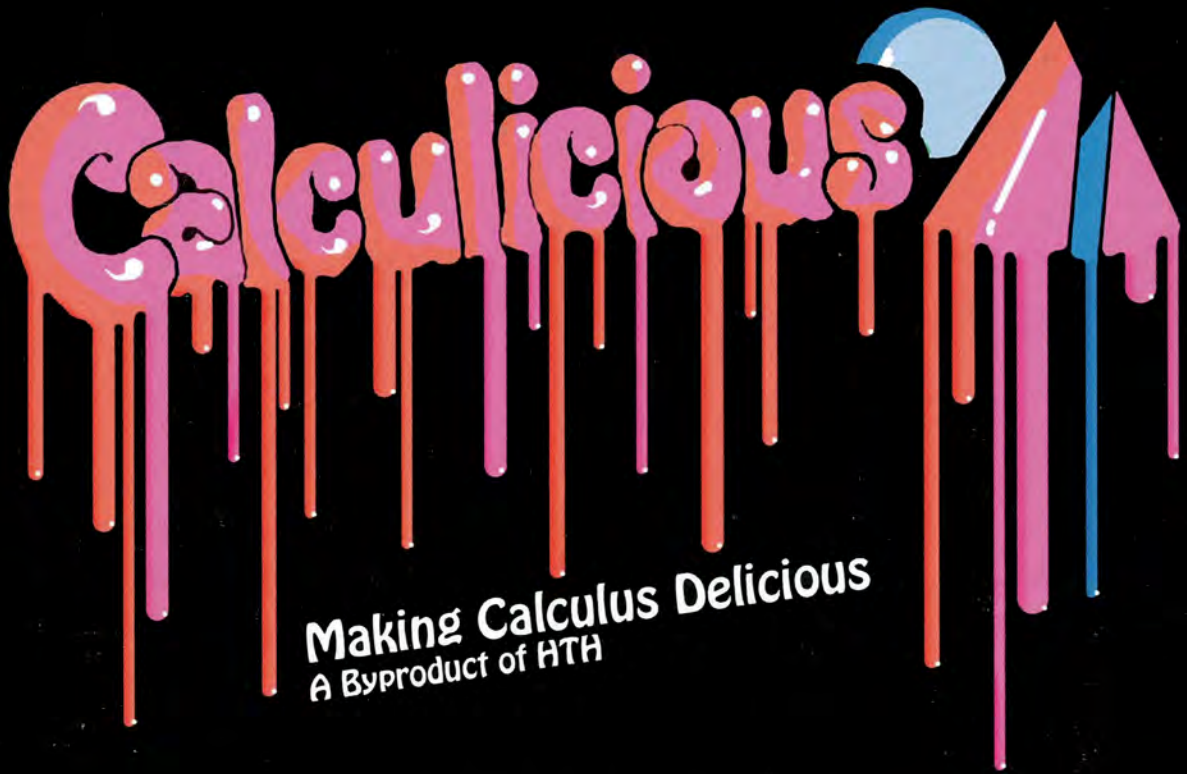


# Calculicious

A High Tech High Project 2009



# Calculicious

Making Calculus Delicious  
A Byproduct of HTH

Edited and compiled by: Miles T. Raya R. Jessica B. Beth J. Annie W. Carl Y. Bev L. Jeff R. and Andrew G.

Calculicious was a cross-curricular project at High Tech High in San Diego. High school seniors were engaged in a project that connected math, calculus and art in a new and delicious way. They were enrolled in a 2-hour math-physics class and a 2-hour art class but had the flexibility to move between the two classes as needed to get their work completed.

We also used an online forum for student critique and review. The text in this book has been taken directly from students' comments in our online forum. This book is a moment in time of our project, recorded on the web, and then made into this static book. Even at High Tech High we dig having books too.



Calculicious ► Forums ► Watercolors ► Donovan's Painting

Watercolor Painting-Donovan

My watercolor is a pyramid with a cylindrical arc going through it. I like the shapes and the design; it was really simple compared to everyone else's, but that's why I like it. It wasn't too hard to find math to apply to my artwork because I knew enough math about all the shapes I used. I used several different shapes in my design. Some shapes include: ellipses, cubes, pyramids, and cylinders. One specific formula I used was the area of an ellipse. I added these shapes to try and make my artwork seem 3D. However, my watercolor still feels a little flat. I think that with more work in sketch up, I would have been able to make more creative designs! Overall, I'm very happy with the outcome of my work.

By Anthony

I like how your watercolor turned out. However, I feel that you need to explain the mathematics a little bit more. There are also a couple of grammatical errors that could be fixed.

By Kristen

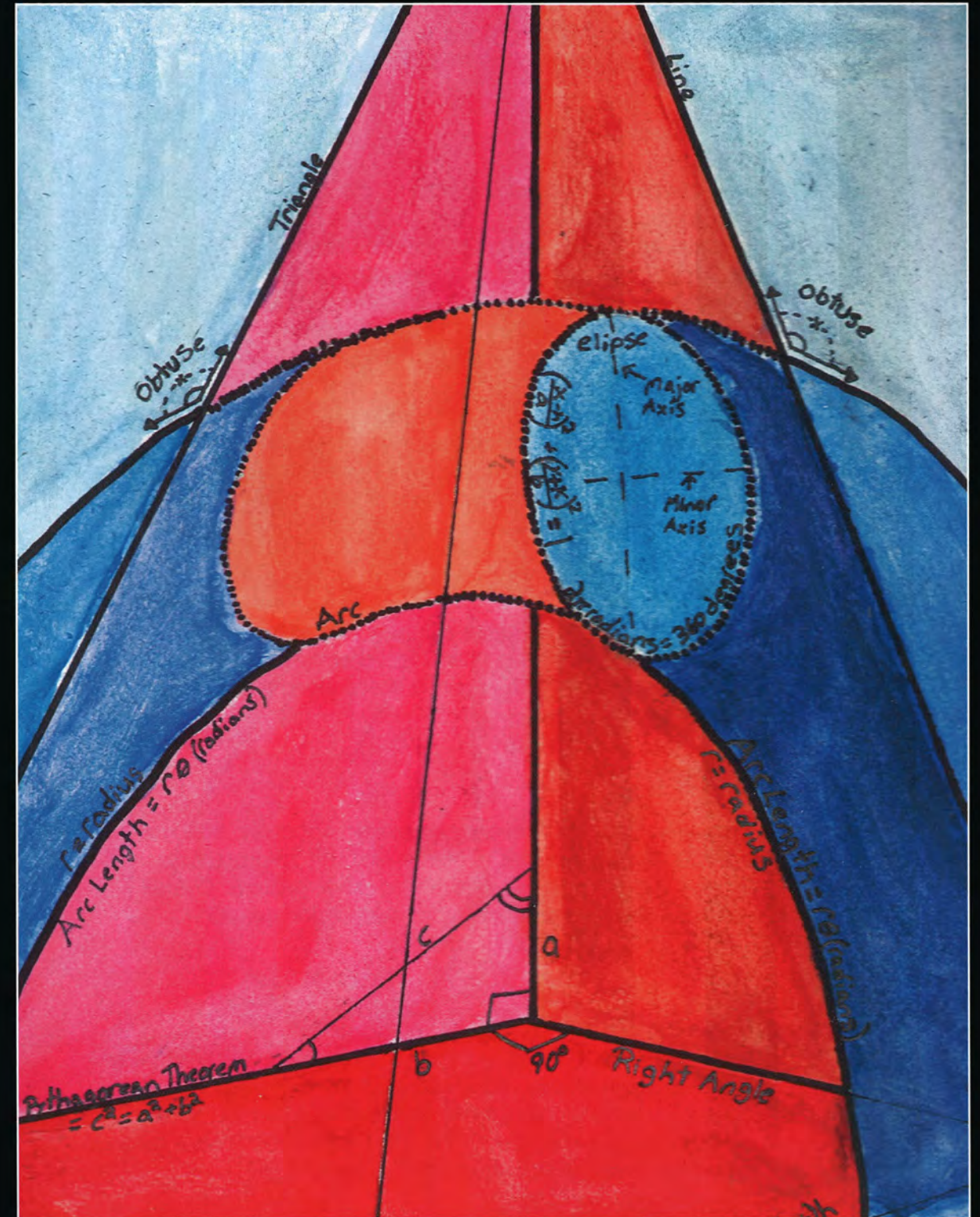
Hi Donovan, I really like the colors in your painting! The contrast between the blue and red is nice, and all of the different colors help you see that your object has shapes inside of shapes!

By Ramona

I think it's funny that you say your water color is really flat, because when I look at it I could see instantly that arc was going through the triangle. I really like your use of colors and although you're use of math is well seen, it doesn't take away from the actual watercolor. Great job.

By Raquel

Your watercolor was very well done and the effort you put into it is evident. I can tell you took a lot of time to make the painting. I love the texture you used to color in your shapes it really adds the feel of your painting. Overall I really like your piece and how it turned out!





Calculicious ► Forums ► Watercolors ► Ana's Painting

Watercolor Painting-Ana

For my watercolor painting, I wasn't inspired by anything in particular but wanted to do a simplistic painting, yet also incorporate a variety of shapes that would create a full composition. In the design process, I tried to keep the math within my range of knowledge and painting ability. Ultimately, this resulted in a slightly dimensional piece involving traditional and somewhat basic math. However, if I were to do the painting again, I would make the shapes different opacities and perhaps a bit more complex to add a bit of depth to the image overall. It would have also created more math because there would be more figures to differentiate. The rectangles in the design show simple area and perimeter equations. The circular shapes feature area, surface area, and circumference equations, as well as labels as to where the radius is located. Triangles in the design also have equations for area as well as the law of sines. Collectively, I am pleased with the overall outcome of my painting.

By Raquel

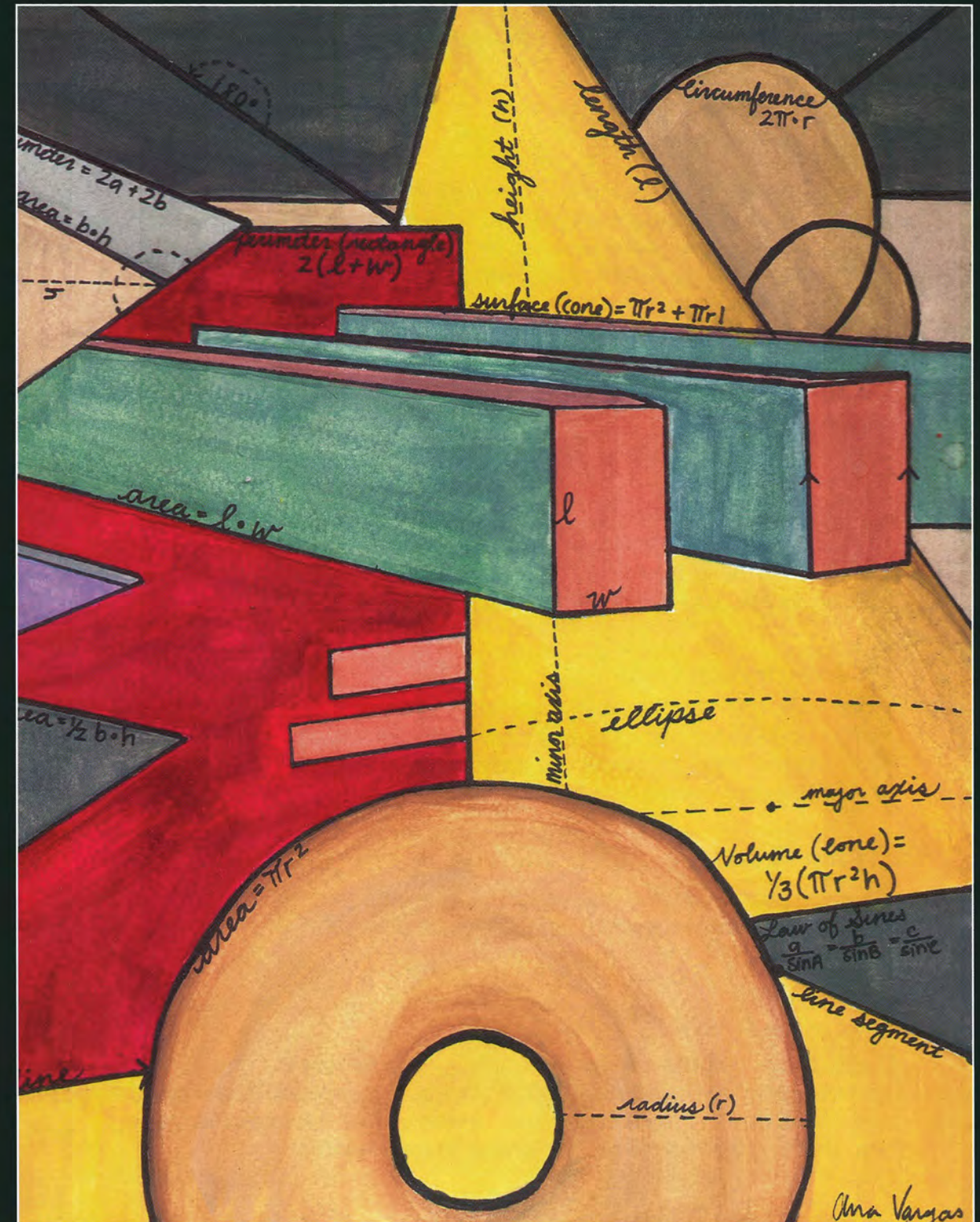
Ana I love your painting and how 3D it looks. I think the texture that you incorporated into the shapes gives it a nice appeal and allows for them to contrast. I especially like how you used a large variety of shapes such as the torus. Overall I love how neat your piece is and how well your write up flows!

By Ramona

I think that your use of colors is what really helps the painting, it makes the painting pop. It's very clean and I like it a lot. I think that the math you put into it really adds to the watercolor. When I was looking at other watercolors such as mine, the math seemed to be out of place, but your watercolor looks like you spent the same amount of time coming up with the composition of the painting as you did putting the math in it. What an amazing turn out!!!

By Amanda

Ana, I really like your watercolor a lot. I think you did a really good job with the colors and textures. The way you made your piece looks really 3-dimensional, good job!





## Calculicious ► Forums ► Watercolors ► Kristen's Painting

### Watercolor Painting-Kristen

The watercolor I chose to paint was the first design I made in Sketch Up. It isn't the favorite of my designs, but each time I look at it I find something positive to admire. Every part of it is completely random; nothing is deliberate in my painting. I experimented with shapes, and this is what became of my experimentation. I learned a lot about watercolors while working on my piece, and I patched up some old misconceptions I had about them. Before I started painting, I had horrible memories from Kindergarten, when I first used watercolors. In an attempt to spread the paint, I plopped four huge globs of water straight onto the page. The next morning I discovered that my paper had shrunk and was wavy, and the experience stuck with me. I was convinced that all watercolors were absurdly difficult, and I would never make a good painting with them. However, when I began painting, everything seemed surprisingly easy. I realized that excess water could be dipped off with a paper towel. Painting was as easy as coloring inside the lines. As long as I mixed the right colors, and put them in their rightful place on my canvas, everything fell into place.

#### By Ana

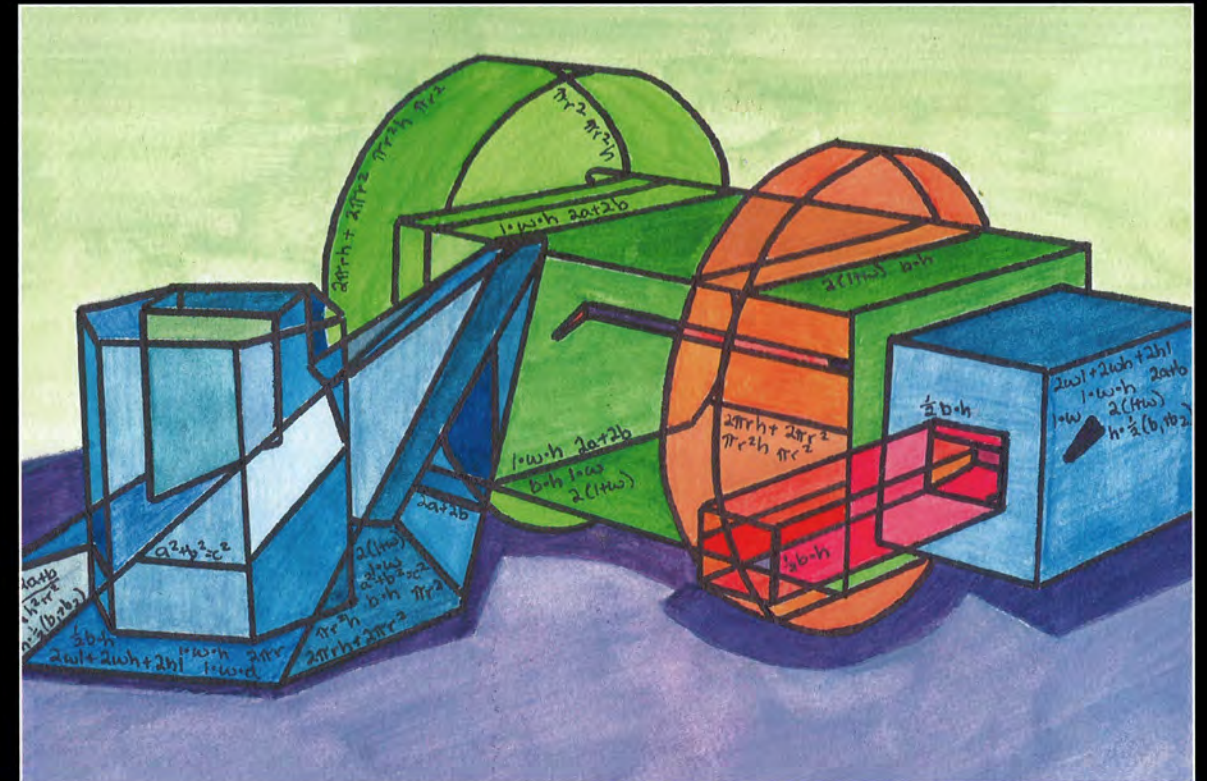
Kristen,  
I can tell you put a lot of work into this piece. The shading is incredible, and I applaud your attention to detail. Great choice of colors as well!

#### By Brad

Your efforts in producing a variety of colors without mixing paint were well worth it. The variety provides your painting with an interesting appearance. It almost looks as though your painting has texture, something tactile that you could feel.

#### By Kristen

The blue was the easiest to make tons of colors from. The most difficult color to get different shades from was the green! It gave me a lot of difficulty. I would add a tiny bit of water to the dark green I had and suddenly it would be so light I could barely see it on the page. Getting that lime green was hard.





Calculicious ► Forums ► Watercolor ► Miles' Painting

Watercolor Painting-Miles

While conceptualizing my sketch-up I intended the structure to emanate immense balance. I constructed a pyramid for a foundation. Then I removed two pyramidal sections. One of the removed sections created a trapezoidal shape. The shape above the pyramid is a very wide cone, almost appearing elliptical. I feel the image exudes an ominous feel. I chose a color scheme that was subtle, yet bold. The mathematics involved are equations applicable for pyramids, cones & trapezoids. Initially I was unsure of how to incorporate the equations into my image. Ultimately I found positions that were conducive to the particular balance of my shapes.

by Ariana

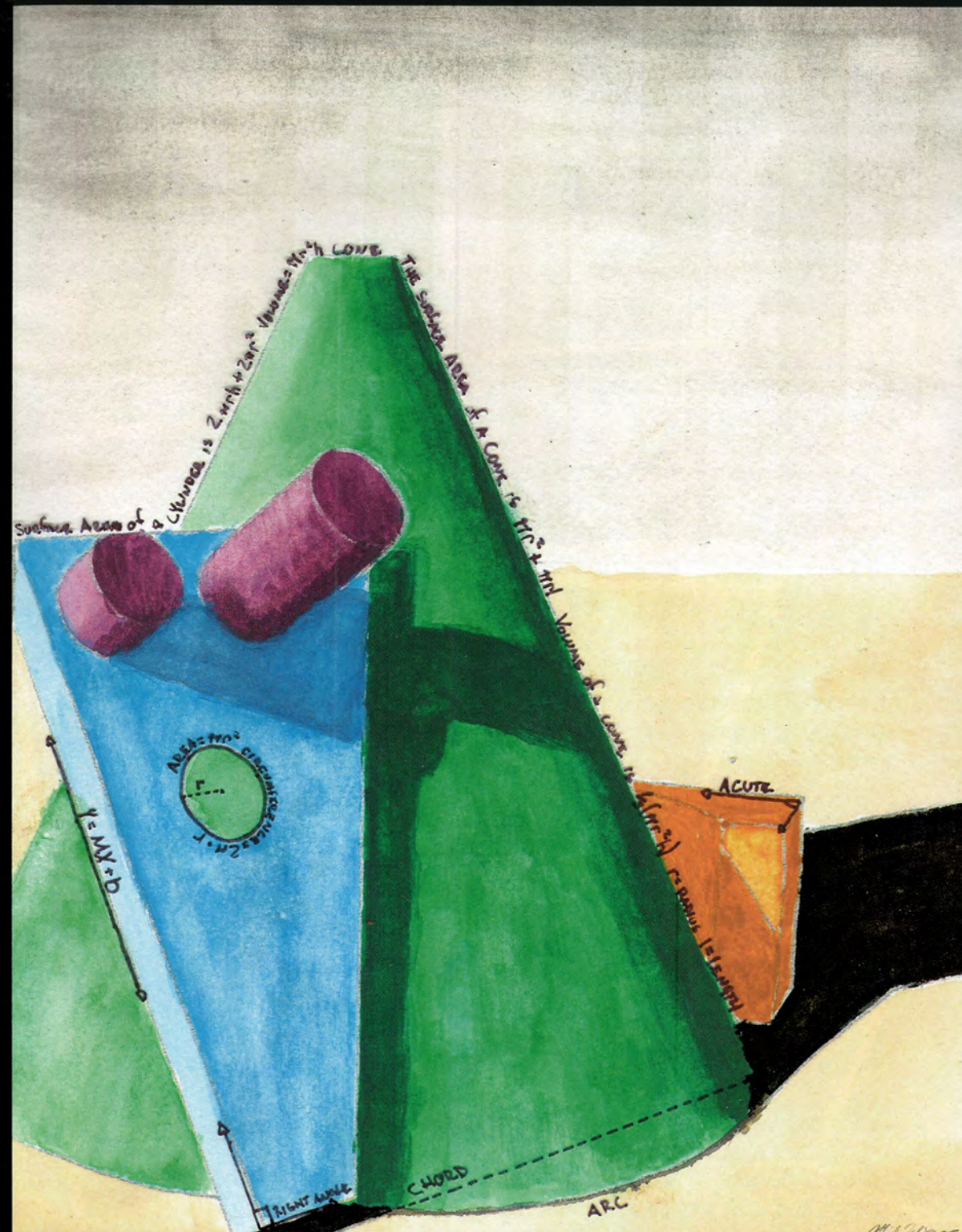
I really like your watercolor! I especially love the intense shading and the overcast sky, not a lot of people have that. It has just the right amount of math on it - enough to display the math involved, but not so much that it interferes with the image. I also like the texturing you did on the shapes, it makes them seem more tactile and real. You did a great job making the image and the math enhance each other. Bravo!

By CJ

Your watercolor looks great, the shadows and color shading looks almost perfect. I also like the simplicity and detail of your watercolor. I think that the math is neatly displayed but I think it would look better with a colored marker, using various colors so that the math formulas sort of pop out.

By Brad

I am most impressed by the shading you managed to produce on the surface of your shapes. It turned out great. The patchy nature of the shading gives your cone a very solid appearance.





Calculicious ► Forums ► Acrylics ► Ariana's Painting

Acrylic Painting-Ariana

My acrylic painting went through many drafts before it settled into its final form. I already knew from the beginning that I wanted a star field in my painting, but I wasn't quite sure how to integrate it. At first, I put just a couple of shapes floating in space. I then had the idea of cropping the star field so that instead of having the shapes float in space, the shape faces would be windows into space. I love the combination of the clear windows showing that the shapes were hollow and finite, and those same shapes having faces that showed the deep infinity of space. However, it still looked incomplete, so I added the stripes in the background to contrast the colors and tones used in the foreground. The star field allowed me to put in the chemical equations for nuclear fusion, which goes on in the center of all stars and creates all elements on the periodic table up to iron. I also got to put in some particle physics, specifically virtual particles and how their existence prevents space from ever being a perfect vacuum.

By Kristen

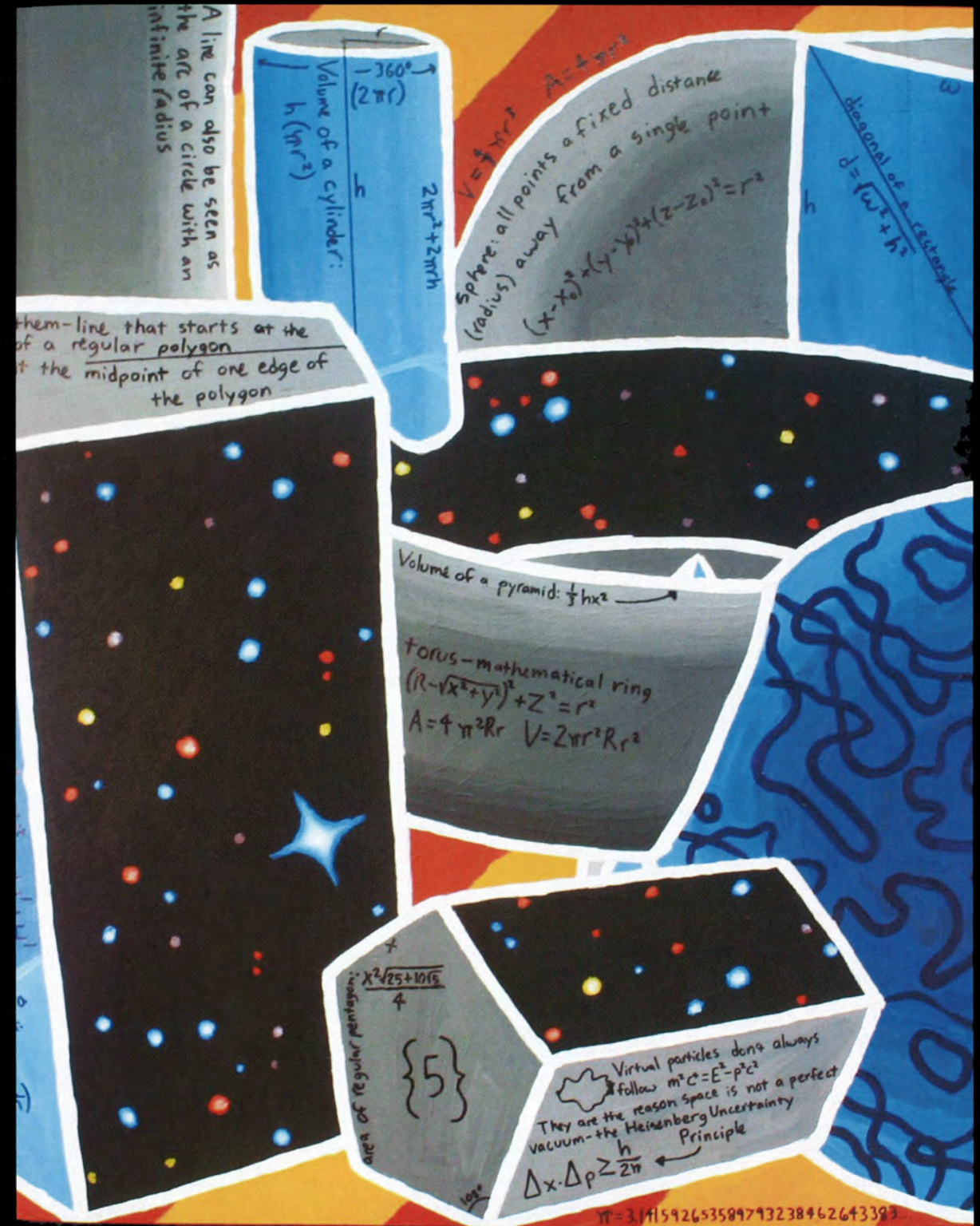
I really like reading about your struggle to put star fields in your painting. In the end, it was integrated well. The only thing I want to know--was this inspired by anyone in particular, or just star fields? Overall, great writing, and great painting!

By Brad

Your star-fields turned out great. They look like windows to space and not just an image painted onto the surface of a shape. The background really enhances your painting as a whole. It provides the perfect backdrop for your painting. The contrast in color makes the blues on your shapes seem all the more vivid. I like it.

By Carl

Your painting has always been one of my favorites ever since I first saw your star fields. They turned out spectacularly and give the painting an extra dimension. The rest of the painting is also great. Your shading is top notch and your design and math are also very great.





## Calculicious ► Forums ► Acrylics ► Ana's Painting

## Acrylic Painting-Ana

The Marquardt Decagon Mask is a facial map based on the Golden Ratio [1.618 (Phi) to 1]. It's used to determine human attractiveness based on the placement and proportion of facial characteristics. Initially, the mask alone was the sole point of my acrylic painting design. However after a meeting with Jeff and some edits, the direct application of the mask to a human face seemed to be a better exercise of the mathematical concept itself. After finding a nice portrait of a profoundly handsome actor named Marty Feldman, I decided to apply the mask to his face in my painting. Outlining and painting small spaces carefully proved to be difficult but important because those fine details composed parts of Marty's face as a whole. I had to remain very aware of lines and borders to keep the face legible. Next, I created the actual Decagon Mask with red yarn to show both consistencies and inconsistencies.

The Golden Section Line is a line sectioned by the Golden Ratio (Phi to 1). This line is the foundation of the Decagon Mask. Its continued duplication and Golden Sectioning comprises the matrix the Golden Decagon Mask is derived from.

## By Kristen

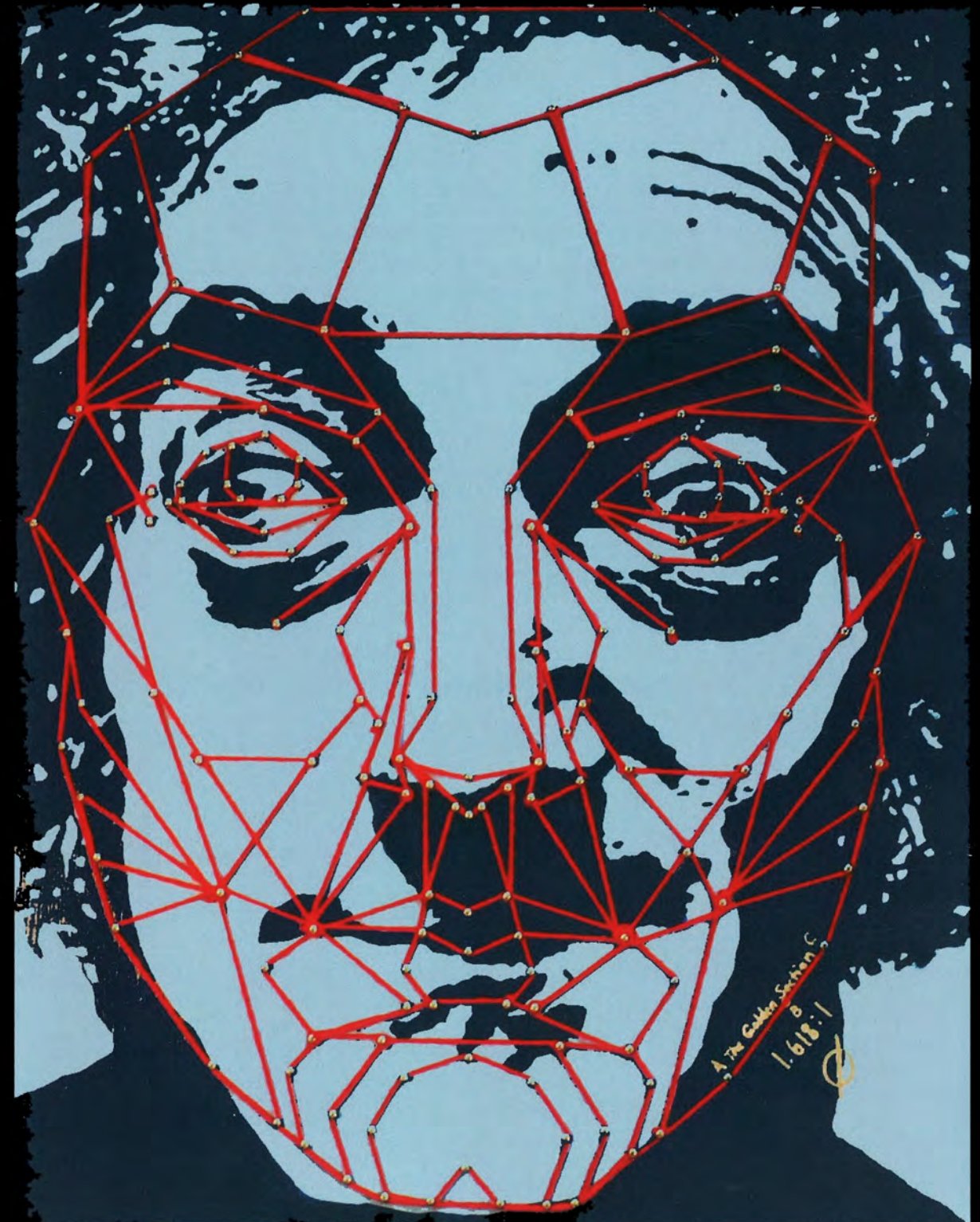
I agree that Marty Feldman is profoundly attractive. I don't think you do him justice... I offer the same advice that you offered me: What did you struggle on? I know the math gave you a hard time, and I think you should explain that in your paragraph. Everything seems effortless, and I think that people might like it more if they hear about your struggles.

## By Jorge

You did a good job on explaining the math behind your painting because it is indeed a very complicated topic to understand. At a first glance I would not be able to tell what you were doing by having put the mask on the piece, but it all makes sense now that you explained it. I would like to hear more about the composition of your actual piece. If you struggled on anything or if you have any regrets on anything you did. Overall good job!

## By Emily

Your painting was really different from the majority of peoples' in that you drew a distinct person as opposed to shapes, and, you used string to display your math as opposed to painting it on. You might want to explain how you made these decisions. Just out of my own curiosity and to show contrast, you could mention someone whose face does fit the decagon mask?





Acrylic Painting-Annie

My acrylic painting was inspired by Georges Braque's 1913 Pedestal Table. I wanted to incorporate aspects of his original painting but I also wanted to make it my own. To recreate Braque's style I first traced the shapes from his painting onto tracing paper and scanned the image into the computer. Through Photoshop I was able to make two dimensional shapes three dimensional; this allowed me to incorporate more math concepts and to make my painting my own. The background designs in my painting were pulled from other artists and were edited and combined with Braque's piece to create my final design. The math concepts that I included in my painting are, the law of reflection, unit circle, sine wave, slope of a tangent line, the product rule, along with math for cones and cylinders. Examples of these concepts are shown and explained throughout my painting. I enjoyed the process of creating the composition and adding pieces to it to make it my own design of work. After I finished the actual painting I was skeptical about adding the math directly to the canvas but after I did, I thought that it added another unique dimension to my work.

By Jen

Annie- I like your painting. For some reason, when I relax my eyes, it reminds me of a room filled with mirrors. I especially like the flower in the corner- it's a nice break from all the shapes.

By Ana

I was also reminded of mirrors. Your painting seems almost mosaic, with all sorts of different patterns and colors reflecting off of something. I also really like the progression of patterns and lines to more solid coloring from the top to the bottom of your painting.

By Kristen

I really like your painting. It's really clean and I really love your color choice. The colors look like they are popping out at me, and I like your use of black lines. The blue you used is really nice it really stand out the most to me. Over all I really like your painting.





## Calculicious ► Forums ► Acrylics ► Jorge's Painting

## Acrylic Painting - Jorge

My acrylic painting is a phone booth in the middle of the streets of London. The colors revolve around the blue-gray color scheme and the phone booth is bright red. I did this on purpose because I wanted the booth to stand out. I'm not going to lie and say that this was a simple piece to paint because it certainly wasn't. I tend to be somewhat of a perfectionist and I really took my time in making every streak of paint as precise as I could. After I finished the art portion of my painting, figuring out what math to add without ruining my piece was the true challenge. I chose to go with vanishing points because they related perfectly to my piece. I figured out where the vanishing points of the shadow were and drilled a screw into it, then I outlined each point with twine and the overall piece turned out better than I thought it would. I also made a dome outline on the top of the phone booth out of twine to show people that phone booths are actually spheres but with the sides cut off. I liked that I was able to incorporate math into a real art piece rather than just shapes because I felt like it was more of a challenge. Overall I am satisfied with the result of my final piece.

by Kristen

Jorge, I really like your painting! The telephone booth is well painted, and I love the different colors on all of the bricks. I also like the rays of light and how they interfere with the colors of the ground. In general, your painting is really unique. Instead of just making random shapes in Sketch Up, you actually made a landscape. I really like it!

by Ariana

Where to begin? I really like the color scheme - I've always liked cool and de-saturated colors. I also like the silhouetted trees - they add a lot to the image without drawing attention away from the booth. The twine for the math makes the painting seem more tactile - it's not just an image. All in all, good job. piece. The final piece ended up looking very nice and I love it.

by Ramona

I think your painting is amazing and you can definitely tell that you put a lot of effort into it. I think the shading in your painting is quiet impressive as well as the effect of the pop-out math.





Calculicious ► Forums ► Acrylic ► Kristen's Painting

Acrylic Painting-Kristen

I based my acrylic painting off of an artist that I greatly admire: Alphonse Mucha. I saw his paintings in most of the hotel rooms I stayed at in Europe, and when I stumbled upon his work online, I knew that he was the person whose style I wanted to mimic. Mucha paints portraits of beautiful women, and his backgrounds are always filled with interesting shapes and designs. One thing that I really liked about his paintings are the half moons that some of his women sit in. I put lots of half moons in my painting, because they are my favorite part of all of his works. Along the sides of my own painting I made up different shapes and designs to paint, just like Mucha. Also, after looking into a specific piece of his, I saw a woman with a red beret in her hair. I have a string of circles on my painting, all connected with curved black lines, and they are based off the hair ornament I saw in the painting. I have more than enough math to cover the entirety of my canvas, not to say that I didn't struggle with it. My half moon shapes gave me the most difficulty. I wanted to do something complicated with them, but after weeks of trying out complex equations with Andrew, I decided to settle for something simpler. I focused on finding the arc lengths and chord lengths of circles. In addition to the previously mentioned math, I have written equations to get the area of squares, rectangles, circles, parallelograms, and cylinders. I have equations to find the volume of rectangles, squares, and cylinders. I have written trigonometric functions on my painting, such as SOH-CAH-TOA, law of sines, and law of cosines.

By Brad

The most interesting part of your painting is without a doubt the perimeter. The designs you placed on the edges of the painting are a nice contrast to the circular shapes located in the center. I find myself admiring the attention to details in the painting. As a whole, the piece is impressive. For some reason, the shapes remind me of a child's toy. It almost looks as though the various half-moons were designed to fit together.

By Kristen

Interesting! I never thought about my shapes resembling children's toys before, but now that I take a second glance I can see what you're talking about. I think the most difficult part of my painting was the black lines. I would outline all of my shapes, but the black lines were too thick. I would then try and thin them out, but I would end up making them too thin and have to start the entire outlining process over again. Thanks for the compliments!





Calculicious ► Forums ► Acrylics ► Kristin's Painting

Acrylic Painting-Kristin

After searching long and hard for an artist I liked I finally decided to use Wassily Kandinsky for inspiration. I gave myself two designs to base my painting off of. Once I finished making the designs I spent time talking with Dr. Gloag about the different math concepts I could use in either of the paintings. After finding the one that had the ideal amount of math on it I started the painting process. Painting my painting was both fun but stressful, adding layer after layer, and different variations of similar colors. The math I used was a lot of triangles and other shapes. I included math for the unit circle and different lines. The Lo-Shu square was a cool math concept I also incorporated into my painting. If you have a 3x3 box, they add to the same number in all directions. Overall I really like my painting and I don't think I would change much on it. There were only minor things like touching up a few areas and one misspelled word. But I really like how the painting came out overall. Doing this painting really taught me different techniques I can use in the future and also made me become a better painter.

By Ana

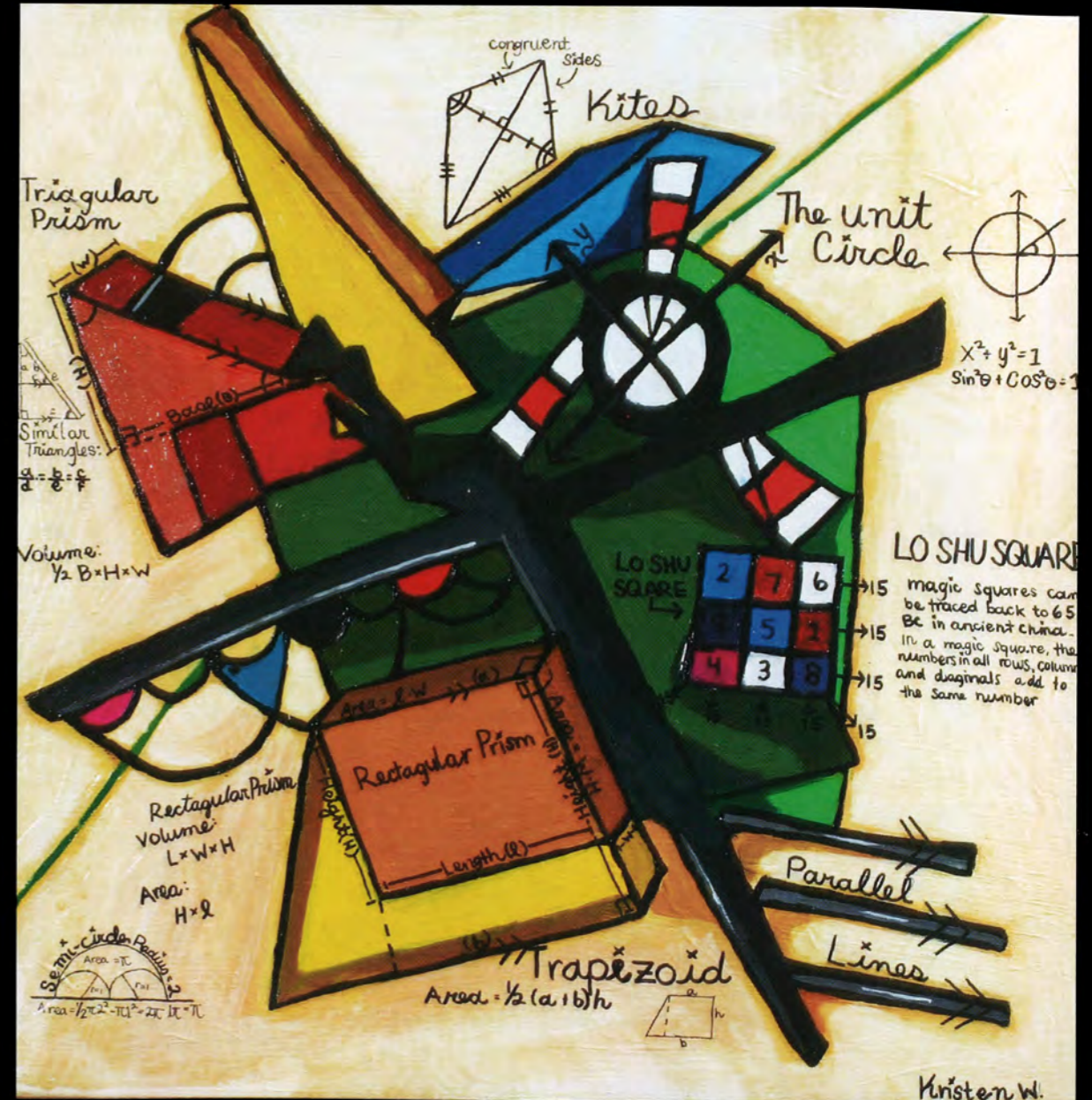
I love your painting! I love the colors, the composition, math placement, and pretty much everything. I feel like you were able to incorporate the math very easily which contributed to the fluidity of the final piece. Good work, and congrats on finishing it in such a timely manner!

By Ariana

Your painting is really intense. You have a lot of detail in a relatively small space, but the simple coloration keeps it from becoming overwhelming. Honestly, if I didn't know better, I wouldn't have thought you had designed this in SketchUp. I know I couldn't have. All in all, good job.

By Jennika

Your painting is astonishing and your attention to detail is AMAZING. There's no doubt that you're artistically talented in more ways than one but your ability to incorporate large amounts of mathematical concepts alongside that is just as mind blowing. Ariana is right- the simple colorations in your painting keep it from being overwhelming but at the same time when I take a look at the Calculicious wall of acrylic painting, yours stands out amongst the group.





Calculicious ► Forums ► Acrylic ► Mariah's Painting

Acrylic Painting-Mariah

I knew from the moment we started this project I wanted to emulate the artist Basquiat in my painting. I found his work inspiring and his style relevant to the project at hand. In many Basquiat paintings he writes all over the background and in some paintings includes mathematical functions and geometric shapes sporadically throughout the piece. This aspect of his style was something I knew I wanted to include. When looking through a Basquiat art book I found a painting he did of a character with arms that made the shape of a parabola, so I decided to recreate this character into geometric shapes and include it in my painting as well. For the background of my painting I included information of parabolas and cylinders which I painted in white and then light blue. The next thing I did was paint the geometric character over the mathematical background. As time passed a rolling pin, earth and conic section were added into the mix. I think the painting turned out great and I am very proud of the work and creativity that went into it.

By Jen

Mariah- I love how you layered the math notes over each other in different colors. I also admire how the body is painted with bold colors, so you notice that before you see the actual written math. Overall, your painting is wonderfully busy, but not cluttered. Your article is great, but did you have any difficulty? Did you edit anything?

By Brody

Mariah, there is so much about your painting that I admire. I love your cones with the yellow beam going through them, as well as the hand--it's so well done! My favorite part is the world, I like seeing the core. It was also









## Sculpture-Bev &amp; Courtney

Our idea was to make plush conic sections. Cone Buddies can show the four different conic sections. The purpose was to make math kid-friendly. Each tag explains the math for its specific shape. Colin, the circle, explains that when a plane parallel to the base intersects a cone a circle is formed. Evans, the ellipse, explains that when a plane intersects the two sides of a cone the intersection forms an ellipse. Prongs, the parabola, shows the math of when a plane parallel to the edge intersects the cone. Hugo the hyperbola shows that when a plane that intersects the base and is not parallel to the side a hyperbola is formed. The equations for the patterns were found and then graphed on Geometer's Sketch Pad. These were then printed out and traced onto the fabric and cut out and sewn together. Plastic bases were put inside, then they were stuffed and sewn. The net of a cone with slant height  $R$  and a radius of the base of the circle equal to  $R/2$  has an equation  $r=R$  when  $0<\theta<\pi$ . The equation for the circle is  $r=R$  and  $r=R/2$  when  $0<\theta<\pi$ . The net for making the two parts of the hyperbola conic section would be  $r=R$  and  $r=R/(2*\cos(2\theta))$  when  $0<\theta<\pi$ . The net for the parabolic conic section would be  $r=R$  and  $r=R/(\cos(2\theta))$  when  $0<\theta<\pi$ . The net for making the ellipse would be  $r=R$  and  $r=(R/2)*1/(1-((\cos 2\theta)/3))$  when  $0<\theta<\pi$ .





Calculicious ► Forums ► Sculptures ► Dee & Donovan's Sculpture

Sculpture-Deandra & Donovan

Our project, The Astroid, was a sculpture that involved a lot of patience and dedication. Made out of metal, yarn and wood, our sculpture successfully met the requirements in order for it to be "Calculicious". At first, we thought that our piece created a hyperbola. However, once we finished, we noticed that our piece had a parabolic shape. We realized that after rotating about the coordinate axis, The Astroid passed the vertical line test and turned out to be a parabolic function. Our piece also incorporates summation notation, the addition of a set of numbers. By creating and adding an infinite number of rectangles under a function, it is also possible to find the area under the curve of the function. The creation of this masterpiece was not so easy. We had to drill over 100 holes into 3 metal bars, and weave yarn in and out of every hole with precision in order to create the crossing effect in our sculpture. Our project turned out to be a great success. We are very proud of our work, and we hope that our sculpture is not only aesthetically appealing, but can help inspire and teach others about math.

By Jorge

I am very impressed with how your final sculpture came out. I remember seeing Dee get very stressed out with the one that you guys had made out of wood and I was not sure if you guys would be able to pull off and make such a complicated sculpture. This looks like it took a lot of time, and more than anything, patience. I love how clean everything looks and also the way you chose to display the sculpture. Great job guys!

By Sam

Despite the grueling and difficult task it was for you to loop all of the yarn together I rather enjoyed the final outcome and feel it looks very Calculicious. I think what really makes this piece visually stunning is the angle that your sculpture lies out giving us a view of all three sides.

By Ariana

I love this sculpture! It's very intense, and the vibrant red adds to the intensity. It's clearly evident you guys put a lot of work into this. I see the sculpture as a tribute, not only to Calculicious, but to perseverance as well.





## Calculicious ► Forums ► Sculptures ► Interwoven Balance Sculpture

## Sculptures-Deja and Mariah's Sculpture

Seeking inspiration Deja and I perused the online collectives of two artists, Andy Goldsworthy and Francis Bacon. Andy Goldsworthy sculpts organic materials to create impermanent installations in natural landscapes. Francis Bacon paintings have a recurring theme of figures encased in three dimensional shapes. We emulated the movement in Andy Goldsworthy's organic structures and the rigid three dimensional geometric framing of Francis Bacon's paintings to create our sculpture. Our sculpture illustrates an organic shape made of wooden dowels winding through a steel welded cube, which is balanced upon a single corner. Our sculpture is indicative of the unsuspected strength an organic structure can have in contrast with the industrial. The organic shape appears as if it is breaking out of its industrial encasement.

## By Emily

I really enjoy your sculpture, and the description of it is really good and explains your thought process really well. However, you might want to mention the math concepts involved, and possibly explain how you constructed it...you were (I think) both new to welding and the wooden part is interesting - are they glued together? On a piece of wire? If you add a bit more about either of those things, I think your paragraph will be really complete. Good job!

## By Courtney

This is actually one of my favorite sculptures made by this class. Really like the way it flows into itself, and the metal and wood seem to be one piece, only divided by material. I can see where one could see the organic breaking out of the industrial, and I think it's very easily displayed within your sculpture.

## By Raquel

Overall, I love the final outcome of your piece. It has a very nice and organic feel to it! I think you were able to accomplish the exact feel you were going for and I think your hard work and persistence was well worth it because your final outcome is very impressive!





## Calculicious ► Forums ► Sculptures ► Block Party

Block Party by Brad Carl Sam

How far can a tower of blocks hang over the edge of a table before it collapses? Like other apparently simple problems, the solution to the block stacking question is far from simple. In a singlewide stack, the problem must be tackled in a unique way. By approaching the problem from the top of the stack, rather than the bottom, one can calculate the relative overhang of each block with ease. One must merely find the center of mass in a single dimension. If half of the mass of the tower is safely resting on the table the tower will not fall. Thus, to calculate the optimal placement for a block, one must find the center of mass of the tower, and then place the next block such that half of the tower's mass is resting on the new block. If one consistently places blocks in this manner, the center of mass of the tower can easily be located by dividing the length of the stack by two.

As one continues to add blocks to the stack, one can achieve an overhang of arbitrary length. Upon close inspection of the stack, an interesting relationship between the harmonic series and total overhang emerges. For a singlewide stack of  $n$  blocks, the maximum overhang is equal to half of the  $n$ th harmonic number. Since the harmonic series diverges to infinity as  $n$  grows, the maximum overhang for a singlewide stack is unbounded. Although the harmonic series diverges, it does so very slowly. The top block, which we will call the first block, goes out by  $1/2$ , the second block goes out by  $1/3$ , the third goes out by  $1/4$ . For a 100 unit overhang, the minimum number of blocks required is greater than the number of particles in the known universe.

It is only natural for one to wonder if it is possible to obtain a larger overhang with the same number of blocks. One need only change the rules slightly. If multiple blocks may directly rest upon a single block, the maximum overhang increases drastically. When more freedoms are granted, the problem becomes incredibly complex. Finding the optimal stack for  $n$  blocks in a multi-wide stack requires a great deal of effort. The math involved in calculating the placement of blocks in an optimal stack quickly becomes collegiate level.

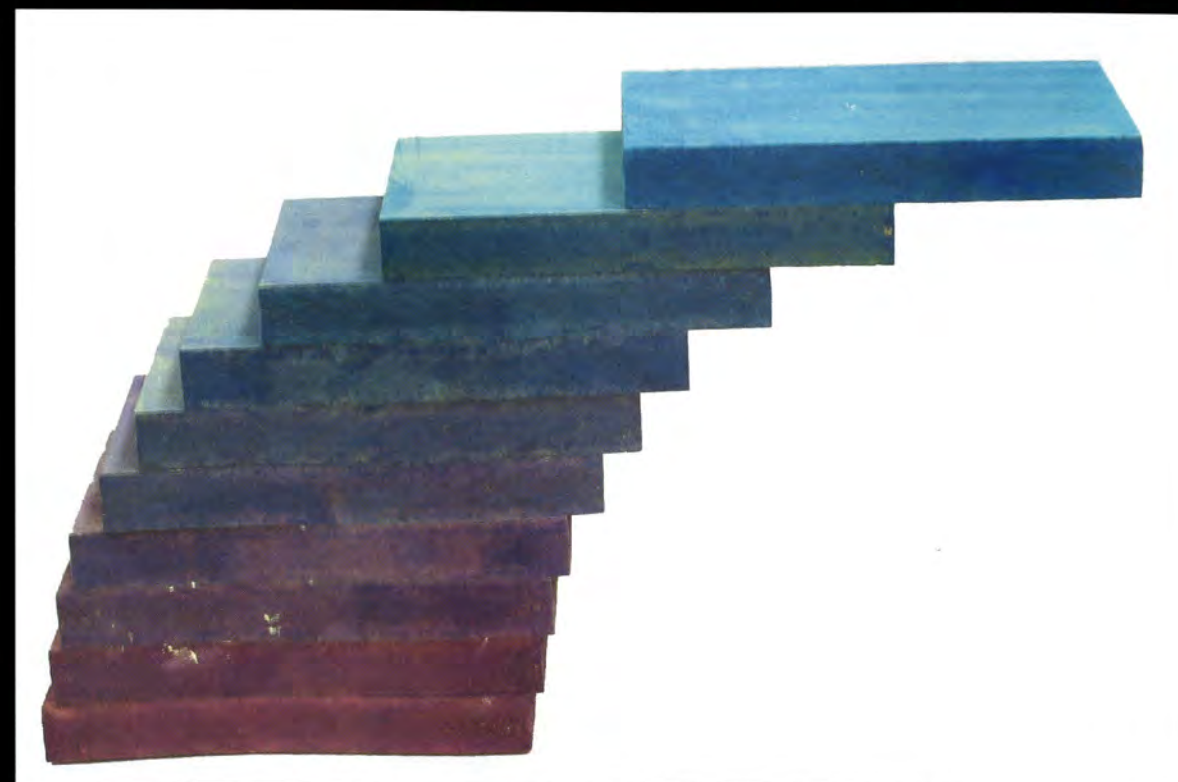
by Beverly

I really like how your project turned out. I think your display was really well done. I like how Sam painted the blocks of the optimal stack because it makes it easier to understand the counter weight.

Good Job

by Courtney

I saw the effort you put into these stacks, and the amount of learning you had to do to make these, and I'm really amazed by how it looks. The colors of your blocks contrast really well, and make it look even more interesting and easy on the eyes.





## Calculicious ► Forums ► Sculptures ► Ellipicious Sculpture

## Sculpture-Nick &amp; Wai Mor

Our sculpture consisted of a stack of spiraling ellipses made out of wood that became less and less eccentric as the stack grew higher. While brainstorming ideas on the best way to stack them, we came up with several options but quickly narrowed it down to just one. Our original idea was to align the center of each ellipse on top of one another with each successive ellipse rotated at a certain degree. This would create a sort of fluidity when looking at it and would finish nicely with a circular ellipse at the top. However, we ended up changing our plan once we had cut out all the ellipses seeing how much nicer it looked when we aligned the ellipses toward the side. This looked like a spiraling staircase and also had the same fluid appearance. The final step we took was drilling holes in each of the ellipses so we would be able to slip a dowel inside, keeping them all straight and together. The dowel also allowed us to spin the ellipses at a variety of angles making our project very fun to interact with. The math pertaining to our sculpture is strictly elliptical, the mainstay being the role of eccentricity. Eccentricity is basically a measure of how stretched out an ellipse is. A circle has an eccentricity of zero, while a flat line has an eccentricity of one. This project came out incredibly well and is definitely one of the nicer looking projects we've completed.

## By Gus

Nick and Waimor, I think your project was one of the more simple designs but really did stand from the other complicated pieces. I really like the way you guys used a simple ellipse shapes to create a sculpture with such significance. I also really like the stain on the wood, it really allows the differences in the Eccentricity to show through.

## By Nick

Hey Nick and Waimor. I really like the way your project looked. It was well polished and very well cut. But what I liked the most about it was just the way the entire piece looks together.







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"This book changed my life!" Uri Geller

This is blasphemy!" Ben Daley