The Colorado State Torus

Edition 6 November 2025

Numerology - Life Path

Page Wilson

As many know, Pythagoras was part of a cult. Part of their belief system was numerology, the witchy study of numbers and their effect on your life. Other fourth years may remember when I did readings and a small presentation our first year, and now I want to spread the information.

There are five main numbers when doing a numerology reading: life path, birth date, expression, heart's desire, and personality. One may easily find their life path number.

To find your life path number, take your birthday and add the digits of the month, the day, and the year separately modulo 9 (with 9 as the representative of [0]) with the exception of the "master numbers", 11 and 22. Then add those numbers together in the same manner.

If one's birthday is November 23, 2003...

$$11/23/2003 \to 11, 5, 5 \to 21 \to 3$$

If one's birthday is July 28, 1873...

$$7/28/1873 \to 7, 10, 19 \to 7, 1, 1 \to 9$$

If one's birthday is April 9, 1998...

$$4/9/1998 \to 4, 9, 27 \to 4, 9, 9 \to 22$$

Each number has an archetype and the archetype is present in their symbol. 1 is the pillar, the instigator, the organizer, the source, and the drive. 2 is the peacemaker, subtle, resilient, and supportive. This number is shaped like a spring. 3 is the sunshine number, playful, creative, inspiring, not too serious, and good at communicating. It has its arms open to others. 4 is (usually) full of sturdy right angles, the rock and cornerstone. This number is practical, good with details, precise, and habitual. 5 is dynamic, persuasive, an explorer, a juggler, and into immediate gratification. 5 is the traveler: when writing the number 5, you must stop and switch directions with your writing implement. The number 6 looks pregnant, 6 is loving, committed, self-sacrificial, focused on community, conscious, a teacher, and a craftsperson. 7 is reminiscent of the tarot card The Hermit with its arm out holding a lamp. 7 is a truth seeker, meditative, scholarly, alone, abstract, and analytical. 8 is a visionary, trying to connect/balance the heaven and the earth represented in the two circles of its symbol. 8 has big dreams, is result oriented, a gambler, powerful, an overseer, and has perseverance. 9 is like the six, pregnant, but towards the world and the heaven. It too is nurturing, but more in a humanitarian way. 9 is a philosopher, an idealist, sacrificial without rewards, an architect, aloof (as in from a distance), and noble.

11 is called "the psychic". 11 carries qualities from both the 1 and the 2. 11's have a lot of nervous energy, charisma, dreams, and its potential makes it lie on the edge of greatness and self-destruction. They say the key to honing this energy and potential lies in the acceptance of your intuition.

22 is called the "master builder". 22 is a mix of an 11 and a 4. 22 is one step up from 11 since the 4 brings balance and discipline to the wild energy of the 11. 22 is a leader, has big ideas, and is unlimited.

I'm interested in seeing what everyone gets and then dividing us into groups to see if there are any cool relations that come up. So let me know what you get!

Why Aren't you Attending Greenslopes?

Joe Geisz, Ian Jorquera, Page Wilson

Most of us have had the experience of going to a talk at a conference and only making it a few slides in, if that. You go to start finding your place in the math community, and you are so quickly shut down and disheartened. You realize how small your knowledge is. You are going out of your way to better yourself, and instead of a positive learning experience, your brain makes the connection that going to a talk equals feeling bad about yourself and wasting time.

Greenslopes is meant to be the antidote to this experience. It is judgment free; the only attendees are your friends. You can learn about research happening in our department in a safe space. Questions are encouraged and we can build each other up without fear of pretense or inferiority. While the authors don't know the history of Greenslopes, the oral history of its purpose is well known - no professors allowed, only peers.

Greenslopes attendance has significantly dropped over the past few semesters. We want to convince you to start attending more regularly, and to encourage presenters to prioritize approachability over rigour.

As for attendance, we encourage you to follow the advise of Henry Adams: "Whenever you attend a talk, and especially if you are a student, prepare at least one question that you could possibly ask ... If there's not time to ask your question after the talk, you now have a question prepared if the speaker sits next to you at lunch. Asking a question is a great way to meet people!" Asking questions can be very scary and surprisingly difficult, but Greenslopes can be a place to practice asking questions. It is good practice to attend talks: you might learn something new, make a new friend or even find a near area of math to pursue. You can learn a lot of math at Greenslopes, but if nothing else you can help build our community.

For those giving talks (and we would love to see some new faces!), remember that Greenslopes is a place to practice giving talks as much as it is a place to support your fellow graduate students in their research. Ask yourself: what got you interested in your research, and how can you communicate your interests to your fellow graduate students? Try telling a story about your process or how research fits into the bigger picture. Don't be afraid to include "obvious" facts, results you believe are well known, or questions that have already been resolved. All of these things can act as motivation for your work. And don't wait until you have to practice your prelim - give an intro talk on a new field you've just discovered! Maybe you'll inspire someone. If you do want to practice your prelim as a Greenslopes talk, consider modifying it to be more friendly to a general audience.

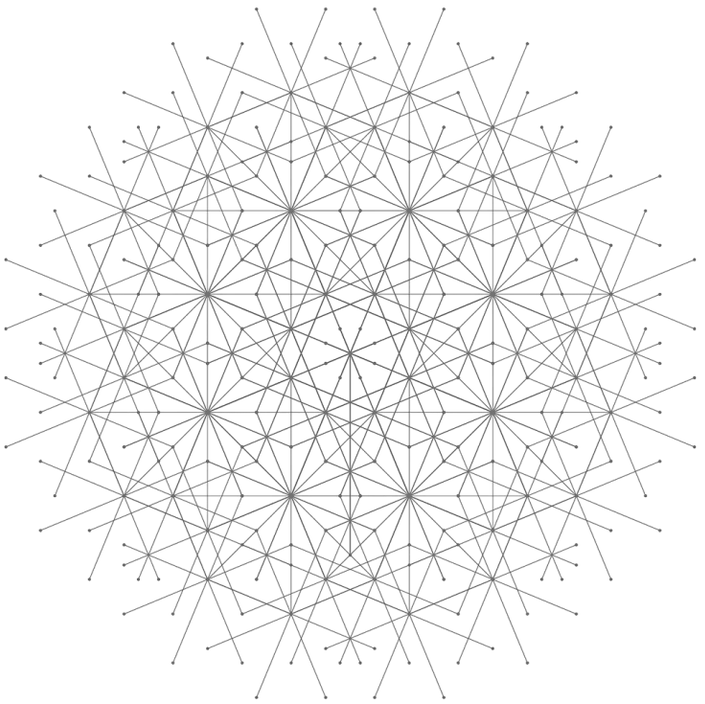
At a conference you will likely be surrounded by people who are experts in your field, and you may be tempted to assume them to be your audience. But in reality this is mistake. The experts in your field should rarely be the primary audience of your talk, as they are likely to make up a minority of the room. Your audience is much more likely to be filled with those who are experts is adjacent fields, or even those who are aspiring to be experts. Your talk should be accessible to them.

Green is used metaphorically to mean inexperienced. Let's make *Green*slopes more approachable and beneficial for those of us who are green, as we all are with subjects unfamiliar to our own.

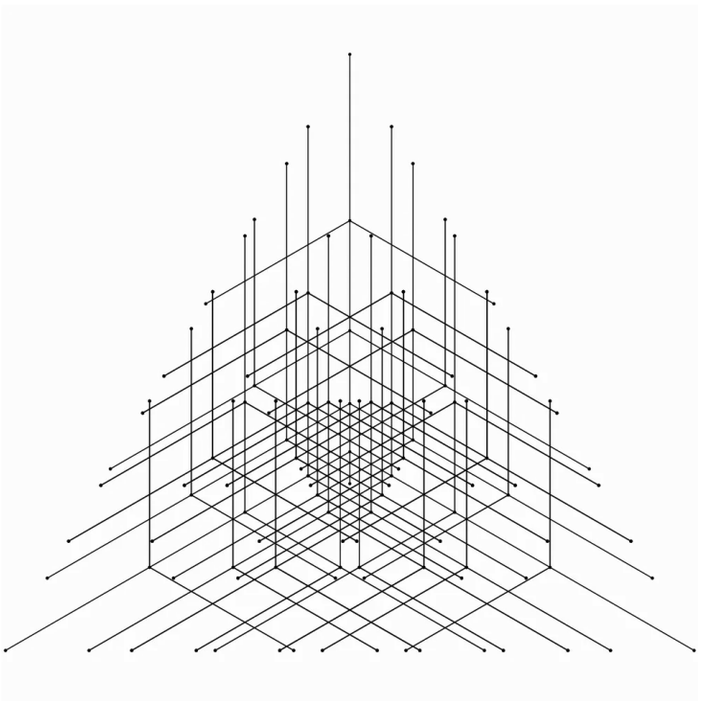
As always, feedback is welcomed at our email address MATH_ColoradoStateTorus @colostate.edu. Note that our inbox is only accessible to the three graduate student editors and we will not divulge any information to others without their express permission.

Mathematical Art

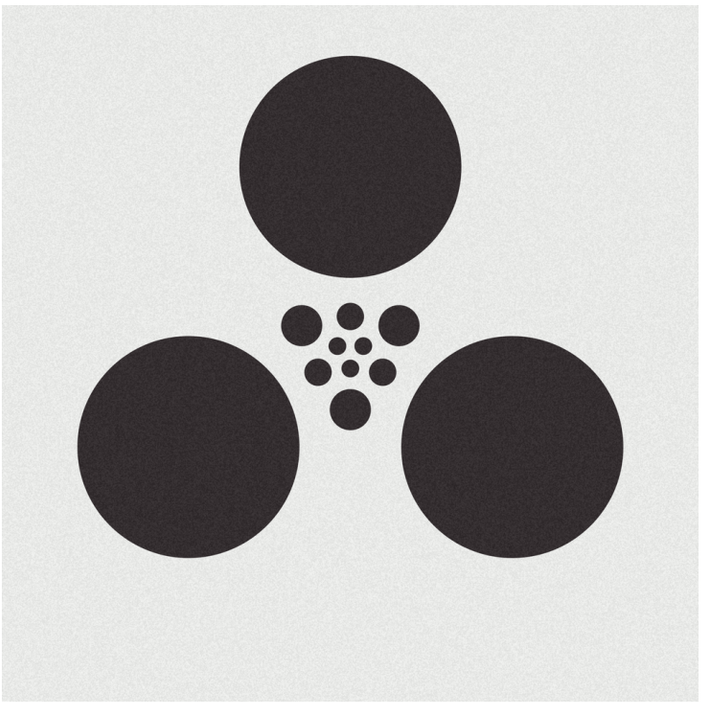
Provided by **Clayton Shonkwiler**



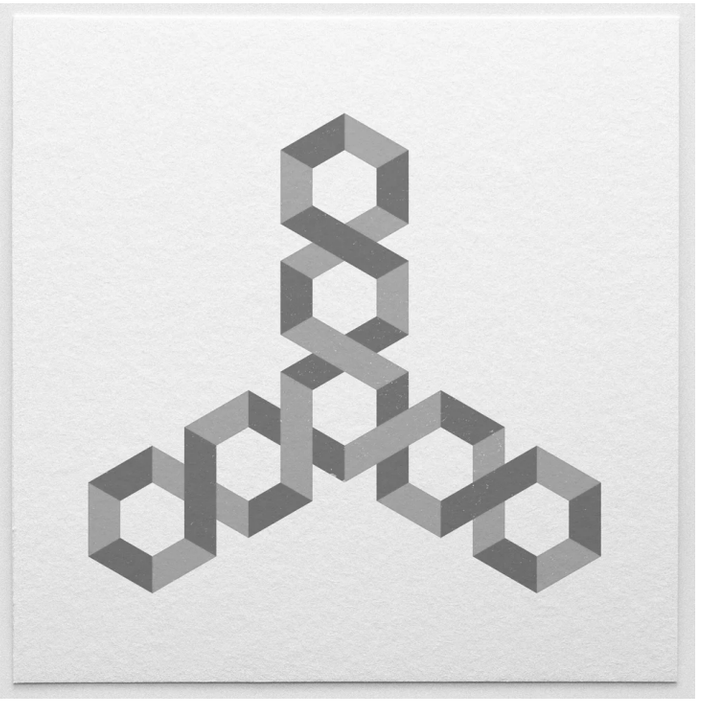
Octoplus



Threes



Platonic–Icosahedron



Triple Junction

November PotM

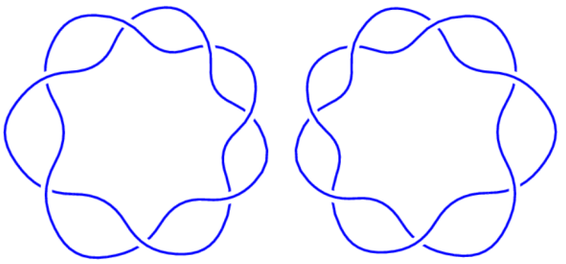
Provided by **Sandra Nair**

Consider a regular n-gon $A_1A_2\ldots A_n$ for $n > 2$ inscribed inside a circle of radius r, with all its vertices lying on the circumference of the circle. Let X be a random point on the circumference of the circle. Prove that the sum of the squares of the lengths of all the chords joining X to the vertices is $2nr^2$. That is, show:

$$\sum_{j=1}^{n}(XA_j)^2 = 2nr^2$$

New Knot News!

Provided by **James Fantin-Hardesty**



$(2,7)$-torus knot and its mirror image

A decades old knot theory conjecture has been unraveled. The conjecture asks, is the unknotting number (the number of crossing changes (or "cuts") needed to transform a knot into a simple loop) additive under addition? Or more specifically, is the unknotting number of the connected sum of two knots simply the sum of their individual unknotting numbers? It turns out, the answer is a surprising no. This means that by combining two knots together, you can end up with a knot that is simpler to unravel.

Mathematicians Mark Brittenham and Susan Hermiller disproved the conjecture with a simple counter example. They showed that by constructing the connected sum of the $(2,7)$-torus knot and its mirror image, the resulting knot has an unknotting number of 5, meaning it would take 5 crossing changes to turn the knot into the unknot. Whereas the two knots each have an unknotting number of 3. And as we all know, 5 does not equal 6.

Classifieds

Crossword Writer Still Needed
The Colorado State Torus is seeking a full time crossword or puzzle writer, to create a monthly crossword or puzzle to be included in each edition of the Torus. Must be able to type. Unpaid position.

Sports News

This month in sports:

- The math frisbee team, the "Open Disks", finished their season with 2 wins and 3 losses. They were eliminated from the playoffs by "Discer Down" on October 9th.
- Jacob Cleveland got 2nd place in his hotdog eating contest. He ate 4 million hot dogs.
- The inaugural math 4-on-4 soccer team, the "Icosahedrons", has so far played two games.
- The inaugural math 4-on-4 soccer team, the "Icosahedrons", has so far won zero games.
- Dr. James Wilson participated in his third competitive hobby horse competition last Saturday. He recieved a participation trophy.
- The "Sitting Ducks" math intertube water polo team has a perfect record of 2-0. Their next game is on November 9th at 4:45pm in Moby Pool. Come cheer them on!

- Are you interested in joining a syncronized skydiving team next semester? Talk to Parker Montfort for more details.

Foto(s) del Mes

This month we have two photos, both provided by Ignacio Rojas. The first photo is from burrito day with the Dean. The second photo is of Hilary playing bass with Salse Forte and Tito Puente jr at Caldac 2025.

Mathematics for Neanderthals

Andrew Reimer-Berg and Tatum Rask

Inspired by the hit party game "Poetry for Neanderthals", we present to you the following challenge: Describe your research using only 1-syllable words. For example, Tatum describes her work as "I count hole in shape as shape change." Submit your answers to either one of us via email. Top responses will be posted in the next edition of the Torus.

Department Concert Calendar

Choice City 7	*Salt Road Brewing*	*Nov 15*
The Retake	*Live@Lunch KRFC*	*Nov 21*
The Retake	*The Gilded Goat Old Town*	*Nov 22*
The Retake	*Panhandler's Pizza*	*Dec 5*
12 Cents for Marvin	*Aggie*	*Dec 11 and 12*

If you wish to have any events listed (music or other arts), please email hilary.tanner.freeman@colostate.edu

September PotM solution

$$x + \frac{1}{x} = \sqrt{3}$$

implies

$$x^2 = \sqrt{3}x - 1$$

$$x^4 = (x^2)^2 = (\sqrt{3}x - 1)^2 = 3x^2 + 1 - 2\sqrt{3}x$$
$$= 3(\sqrt{3}x - 1) + 1 - 2\sqrt{3}x = \sqrt{3}x - 2$$

and similarly,

$$x^{2^3} = (x^{2^2})^2 = (\sqrt{3}x - 2)^2 = -\sqrt{3}x + 1 = -x^2$$

It is easy to see that:

$$x^{2^{2n+1}} = -x^2 = -\sqrt{3}x + 1$$
$$x^{2^{2n}} = x^4 = \sqrt{3}x - 2$$

We note that $1000 = 2^9+2^8+2^7+2^6+2^5+2^3$, giving us:

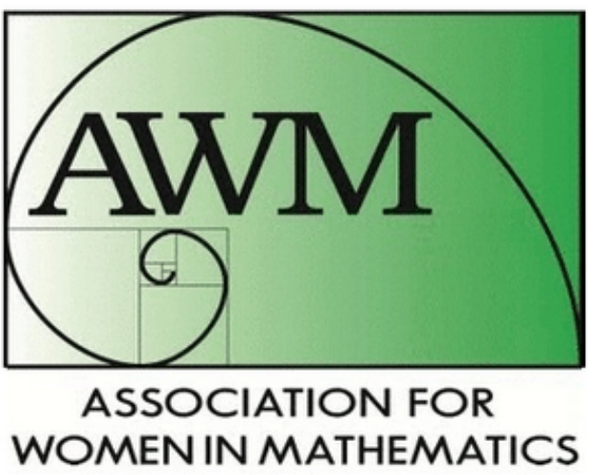
$$\begin{aligned} x^{1000} &= x^{2^9+2^8+2^7+2^6+2^5+2^3} \\ &= x^{2^9}x^{2^8}x^{2^7}x^{2^6}x^{2^5}x^{2^3} \\ &= (-x^2)(x^4)(-x^2)(x^4)(-x^2)(-x^2) \\ &= x^{16} = x^{2^4} = x^4 \end{aligned}$$

So,

$$\begin{aligned} x^{1000} + \frac{1}{x^{1000}} &= x^4 + \frac{1}{x^4} \\ &= (x^2 + \frac{1}{x^2})^2 - 2 \\ &= ((x + \frac{1}{x})^2 - 2)^2 - 2 \\ &= ((\sqrt{3})^2 - 2)^2 - 2 = -1 \end{aligned}$$

Association for Women in Mathematics

The Association for Women in Mathematics at Colorado State University meets once a month on the first Monday or Tuesday of each month. AWM is open to all and often provides snacks, so drop in on one of our meetings! Our next meeting is on ***Monday, December 1st****, at 5-6pm in Weber 15. We will be doing Mathematical Crafts and Games. AWM also runs a mentoring program each semester pairing undergraduates, graduate students, and faculty, so be on the lookout for the mentor/mentee sign-ups next fall! For more information and to sign up for our mailing list visit: mathematics.colostate.edu/awm/*



The GSC is trying to learn some anonymously shared information about how students feel about their departments across campus. If you have time and/or any thoughts to share Please scan and submit your opinions

From the Editorial Board of the Torus

We hope you have enjoyed the sixth edition of The Colorado State Torus! The success of the Torus requires article submissions from our readers, do you have an idea for an article or comic but just haven't had the time to write it? We hope you take the chance to do something creative and submit a contribution for a future article: You can email your submission to our email address **MATH_ColoradoStateTorus@mail.colostate.edu**. We also want to remind our fellow graduate students that participation in the newsletter is required for graduation, this is a threat.

Love from your editors,
Ian, Joe and Page

November '25 Crossword

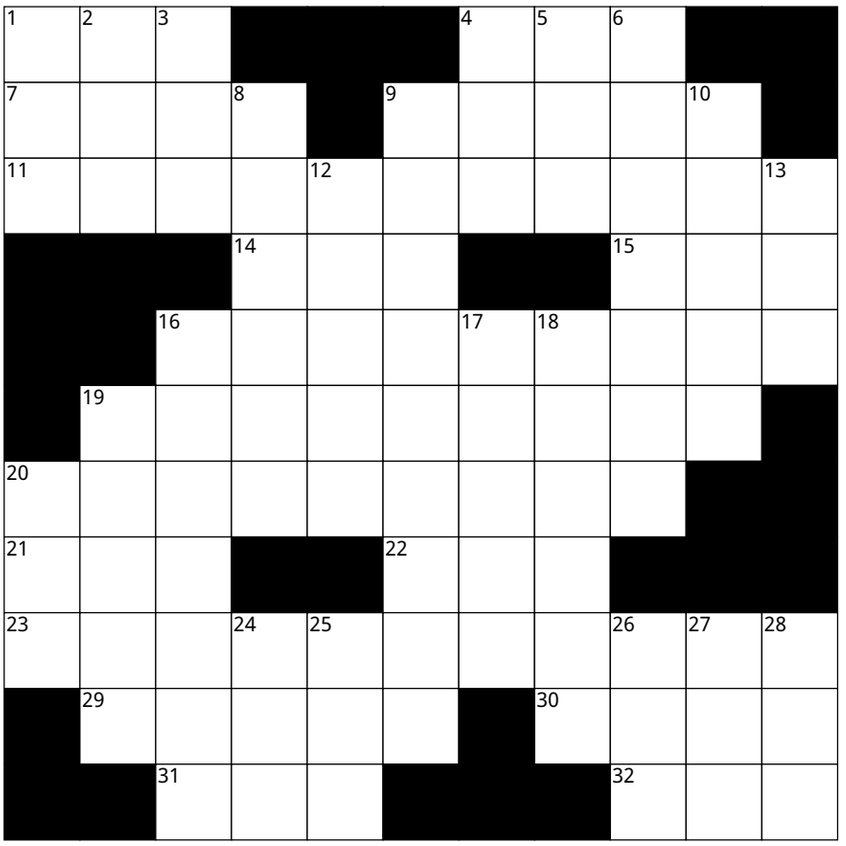
Kyle Salois

ACROSS

1 Alphabet trio
4 Fedora, for one
7 Wellington, for one
9 Train stop
11 A function which is its own derivative
14 Isn't, maybe
15 MLB southpaw
16 Color changer
19 Caramel counterpart
20 Contest conquerors
21 Big airline, abbr.
22 Gun lobby org.
23 Capitalist class, in Marxist philosophy
29 Twirls
30 Punch
31 __ Dhabi
32 "See you later!"

DOWN

1 Honest ___
2 Punch
3 Steal
4 Rooster's mate
5 Song by Rosé and Bruno Mars
6 Facilities
8 "___ it may concern"
9 Iowa capital
10 Resort lake
12 Civil rights org.
13 ICU worker
16 Taco bell offering
17 What Spanish Olympians go for
18 Balconies
19 Pandemonium
20 Baby bear
24 Tease
25 Large antelope
26 Cry
27 Slippery, perhaps
28 Barely make, with "out"



October Solutions