Aquinas Scholars HONORS PROGRAM

The SCHOLARS JOURNAL

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FEBRUARY

MONTLHY RECAP

February marked the start of the spring semester, a time filled with fresh energy, new goals, and new beginnings. Though the month moved quickly, it brought a meaningful mix of challenge and excitement as everyone settled back into routines.

Students and faculty embraced the transition with focus and determination, adjusting to new courses, responsibilities, and opportunities. Classrooms quickly became active spaces of learning, collaboration, and growth, setting a positive tone for the months ahead.

As we head toward spring, we're excited to build on this momentum and continue the strong start to the semester. Keep up the great work everyone!

FEATURED

LOST AT SEA

Taylor Kill

I look out on the untouched waves,
as I feel my boat drift and sway.
I silence all feelings of fear
and wonder if anyone has ever been here.
I awake to the sun's shining light,
the feeling of my boat shifting left and right.
Here I am in a desolate place,
the salt in the breeze kissing my face.
Some might call it lost at sea,
but I feel this place becoming part of me.

THE CLIFFS OF MOHER

Anya Stupar

An image from a visit to the Cliffs of Moher, a popular tourist attraction and natural site in Ireland. The Cliffs are located in County Clare on the western coast of Ireland, near the city of Galway. Scenes from a number of famous movies, including The Princess Bride and Harry Potter, have been filmed there. Our visit included multiple spots along the Cliffs, with opportunities for hiking, along with a visit to the Burren terrain.

AI AND EARTH: A SHORT SOCIAL JUSTICE ESSAY

Marisa Novak

When ChatGPT was launched by OpenAI in 2022, its popularity was immediate and widespread. Millions of users across the globe incorporated the technology into their lives, using it to answer emails, do school and work projects, and even to conjure artificial romantic partners and friends. Since then, use of ChatGPT, along with other AI platforms, has evolved. Every day, thousands of AI-generated images, articles, and advertisements circulates on the internet, swiftly taking the place of the filler content clogging platforms such as Facebook, Instagram, and X. However, very few people know the true impact of this overuse of artificial intelligence technologies. AI isn't just bad for people's attention spans and work ethic, it is also harmful to the environment because of the energy required to power the supercomputers, the toxic waste emitted from data centers, and the overconsumption of natural resources such as fresh water in places that already lack them.

Artificial intelligence platforms are powered by massive supercomputers housed in data centers all over the world, but the energy required to run these supercomputers places strain on energy grids. According to Kandemir (2025), AI data centers use as much as 4.4% of US electricity. For comparison, airports only consume 0.1% to 0.2% of US energy (DeGood, 2022). That means that artificial intelligence technologies use more energy than all the airports in the country combined.

AI data centers require large amounts of energy because training large language models such as ChatGPT involves running thousands of high-level computer processing units continuously for months and then retraining the models when they become irrelevant. This is a lengthy, expensive, and inefficient process that is becoming lengthier, costlier, and more inefficient as AI technology becomes more complex. The energy used by data centers comes from fossil fuels such as coal and oil, which contributes to the greenhouse gas emissions that are responsible for global warming.

Furthermore, artificial intelligence companies have also come under fire for the toxic waste emitted from their data centers. Brabenec (2025) reveals that xAI's data center, used to train the commonly used AI known as Grok, near Memphis contained 33 methane-powered turbines despite only being permitted to use 15. These turbines pumped dangerous chemicals, including formaldehyde, into the air. Residents, many of them Black and lower middle class, have experienced an increase in cancers, respiratory problems, and cardiovascular issues. This story is not unique. AI data centers around the world use PFAS gas in their cooling equipment. When released into the environment, PFAS gas is known to accelerate the greenhouse effect caused by fossil fuels. It is also known to cause various cancers, reproductive harm, immune system

dysfunction, high cholesterol, kidney disease, and other serious conditions in both humans and animals. Worse yet, PFAS compounds do not naturally break down in the environment, earning them the moniker “forever chemicals.” This means millions of humans and animals worldwide are being exposed to harmful substances via data center emissions that will never break down, leading these compounds to circulate in the environment forever and cause potentially irreversible damage.

The equipment used to cool the semiconductors in AI supercomputers also uses large amounts of fresh water—often in environments where it is already scarce. Yañez-Barnuevo (2025) revealed that AI data centers can consume as much as five million gallons of water per day, which is equivalent to the amount of water used by a town of 10,000-50,000 people. This is fresh water that could be used by humans and animals to fulfill their basic needs but is instead being used by data centers that are already releasing toxic waste and greenhouse gasses into the air. Three percent of all the water on Earth is fresh water, and because of climate change, that supply is already dwindling. Furthermore, most of the water used by AI ends up evaporating, and what is left is sent to wastewater facilities that do not have the infrastructure to handle the large volumes of water that they are receiving from these data centers. This means that most of the water used by AI data centers is wasted. Local communities are already being impacted. Gordon (2024) reports that up to two-thirds of the globe experiences severe droughts for at least one month out of the year, and that number is expected to increase as AI steals even more of the world’s freshwater. Billions of people go without fresh, clean water, which is essential to the survival of all life on Earth, and AI is already making this problem worse. That means entire communities are losing access to the most crucial resource this planet can produce because of AI companies and increased AI use, which will cost them their health.

Artificial intelligence took the world by storm when it was made available for public use in 2022, but its impact on the environment and human society has been far from positive. The data centers needed to develop, train, and run AI systems are powered by fossil fuels, and they release toxic chemicals into the air. This accelerates climate change and poses health risks to billions of people all over the world. AI data centers also require massive amounts of fresh water to perform their operations, which worsens water shortages worldwide. To limit the impact of AI on the environment, governments around the world will have to impose regulations on the technology’s consumption of natural resources and their ability to pollute. Additionally, AI companies will have to innovate to make their products more sustainable by finding alternative energy sources and ways to cool the supercomputers. AI companies will also have to take accountability for the harm they have inflicted upon communities all over the world by formally apologizing and perhaps even offering formal, financial reparations to go towards the medical care of those affected. Otherwise, the consequences will be disastrous for the environment and all life on Earth.

RELATIONSHIP BETWEEN A FUNCTION AND ITS DERIVATIVE

Dat Nguyen

LETDET

As Konhauser 2026 is coming up, it'd be nice if we can take a look at some previous problems. Konhauser Problemfest is a prestigious math contest established in 1993 in the memory of Joe Konhauser.

In this investigative issue, we will look deeper into the connection between a function and its derivative, which a lot of us encounter in CAL I, II, III. Usually, we can find f'(x) if I know f(x), and vice versa.

(1) $f(x) = x^3 + 4x^2 + 1$, therefore, $f'(x) = 3x^2 + 8x$
(2) Or $f'(x) = 3x^2 + 8x$, take the antiderivative from both sides, $f(x) = x^3 + 4x^2 + C$, C is a constant.

What if there is no implicit function of x, and its derivative function, are we still able to figure out the function itself?

(1) (Konhauser 2023, Problem 8) On her most recent calculus exam, Professor Toughgrade chose two particular functions f(x) and g(x), and asked students to find the derivative of the product f(x)g(x). One of Professor Toughgrade's students had not studied very well and used the following (very wrong) formula: $(f(x)g(x))' = f'(x)g'(x)$. Nevertheless, even using this wrong formula, the student got the right answer for the derivative of $f(x)g(x)$. On Professor Toughgrade's exam, the function g(x) was $g(x) = xe^e - e^x$ and the function f(x) satisfied $f(x) = 3$. What was f(x)? Give yourself sometime trying first!

First thing we do have in our hand is that: $(f(x)g(x))' = f'(x)g'(x)$
Based on what we have known about derivative of the products of 2 functions: $(f(x)g(x))' = f'(x)g(x) + f(x)g'(x)$
=> $f'(x)g'(x) = f'(x)g(x) + f(x)g'(x)$, (2), in this case!

In a math problem, we'll try to exploit all the conditions we have. We know g(x), can we connect g(x) somehow?
$g(x) = xe^x - e^x$
$g'(x) = (xe^x - e^x)' = (xe^x)' - (e^x)' = (x'e^x + (e^x)'x) - (e^x)' = e^x + e^x x - e^x = e^x x$

Plug g(x) and g'(x) in whatever we have:

$$\begin{aligned} f'(x)g'(x) &= f'(x)xe^x \\ &= f'(x)g(x) + f(x)g'(x), (2) \\ &= f'(x)(xe^x - e^x) + f(x)xe^x \end{aligned}$$

Notice carefully, you'll see except all the mess of x and e^x, there're only f'(x) and f(x). Our very instinct tells us to sort f(x) and f'(x) in one side and to seperate the rest.

$f(x)xe^x = f'(x)(xe^x - xe^x + e^x) = f'(x)e^x$
<=> $\frac{f'(x)}{f(x)} = \frac{xe^x}{e^x} = x$, (3)
Now you do have the relationship between f(x) and f'(x) now, is it sufficient to figure out f(x)? Not quite, that's why we have f(x)=3

From function (3), we don't want f'(x), we want f(x), by somehow we try to get rid of f'(x). What is the best way to do it? Exactly, INTEGRALLLL!

$$(3) => \int x\,dx = \int \frac{f'(x)}{f(x)}$$
$$<=> \frac{x^2}{2} = ln|f(x)| + C$$
$$<=> f(x) = e^{x^2/2-C}$$
$$f(0) = e^{-C} = 3 => C = -ln3$$

Using the same idea in solve a tricker one. The main idea for this one will be how you can integrate the connection between f and f', or g and g'

(2) (Konhauser 2025) Let f and g be differentiable functions defined on an open interval around x=0, such that:
$f' = \frac{1}{g^2}, g' = -fg, f(0) = 2, g(0) = \frac{1}{2\sqrt{2}}$
Evaluate $f(\pi/24)$ and $g(\pi/24)$.

It's very annoying as in this problem, there's another implicit function, g(x), instead of clearly being stated in problem 1, is connected through f. Follow our instinct, we will try to seperate f and g (we cannot really see anything through f and g equations, so seperating them gives us a better look!)
Combining both equations together:

$$\frac{f'}{g'} = \frac{1}{g^2}\frac{1}{-fg} = \frac{1}{-fg^3}$$
$$<=> ff' = \frac{-g'}{g^3}$$
$$=> \int f df = -\int \frac{dg}{g^3}, (4)$$
$$<=> f^2/2 = g^{-2}/2 + C$$
$$=> f^2 = g^{-2} + C = f' + C$$

Again what we are doing here is trying to get rid of the f' and g', so that we can have solely the relationship between f and g. As the problem only offers the equations between either f' and g, or g' and f. But if we have solely f and g, then we'll able to deprive equations of f and f', or g and g'.
After we get $f^2 = f' + C$ and $f(0) = 2$. Similar to problem 1, we finally are able to find f function. Plug in x=0, we'll get $f^2 = f' + 4$. Same idea for problem 1, grouping f and f' in one side then integral both sides

$$f^2 = f' + 4$$
$$1 = \frac{f'}{f^2 - 4}$$
$$x + C = arctan(f/2)/2$$
$$f(x) = 2tan(2x + \pi/4)$$

Therefore, we can find $f(\pi/24)$.

LONDON!

Madelyn Anderson

Hello Scholars! My name is Madelyn Anderson, and I am a sophomore in the Aquinas Honors Program currently studying business abroad. Living in London so far has been such a cool opportunity, especially because I am staying with a London family, immersing myself in their culture and customs. I cannot wait to keep exploring the city and traveling in the UK/Europe on the weekends. So far, some highlights have been visiting Tower Bridge, Buckingham Palace, walking down Notting Hill, and touring Parliament. Another fun fact about me is that I studied abroad on the Rome Empower program last semester as well. If you are considering reaching out with personal questions about studying abroad, please email me at my St. Thomas email address! I would love to give you any advice and share my favorite places.

Madelyn Anderson in London with her roommates Lauren Bakkestuen and Erin Holliday.

COLORADO

Soren Gabor

I traveled to Colorado with my family recently, skiing at several destinations from Copper Mountain to Keystone. We explored some expert terrain that had just opened after a huge snowstorm – this video captures that experience through my eyes.

Here's the video link: https://link.stthomas.edu/SorenVid

SUMMIT LEAGUE CHAMPS

Reilly Kurth

2025 Summit League Volleyball Champions: University of St. Thomas
This photo shows the 2025 University of St. Thomas volleyball team. This season was especially meaningful because it marked the end of our transition period as a program, making it the first year we were eligible to compete in postseason play. We took full advantage of that opportunity, winning in our first postseason appearance and advancing to the NCAA Tournament. This moment represents both the hard work of our team and a major milestone for the program.

TOMMIES TAKE ON NYC

Eva Wayne

Shown here is a photo taken at New York Stock Exchange. This entity has undergone many changes since its inception in 1792, but it remains the biggest stock exchange in the world by market capitalization. Visiting this site was integral to my Finance on Wall Street course, as immersive learning is what studying “abroad” is all about!

GERMAN KARNIVAL

Paul Louvar

Helau! Greetings from German Karnival!

The image shown above shows one of the many Rosenmontag Parades that highlight the German Karnival Holiday (This particular parade taking place in Mainz, Germany is the 2nd largest in the country). The Karnival celebration begins 11 minutes after the 11th hour on November 11th with Rosenmontag (a similar celebration to Mardi Gras) acting as the pinnacle directly preceding the Lenten fasting time. Rosenmontag translates to Rose Monday (Also known as Shrove Monday) and is always the Monday before Ash Wednesday. Feasting, parties, and parades are common with spectators and performers sharing a traditional greeting consisting of a big wave and a jolly "Helau!" Though not a national holiday in Germany it is extremely well visited in certain areas with cities like Cologne and Mainz completely shutting down for the day.

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