



THE TIMES OF INDIA

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TODAY'S EDITION

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STUDENT EDITION
WEDNESDAY, DECEMBER 1, 2021

CORONA UPDATE

OMICRON RISK "VERY HIGH", ALERTS WHO



The Omicron coronavirus variant is likely to spread internationally, posing a "very high" global risk of infection surges that could have "severe consequences" in some areas, the World Health Organisation (WHO) said on Monday. The UN agency has urged its 194 member states to accelerate vaccination of high-priority groups in anticipation of increased case numbers to ensure that mitigation plans are in place to maintain essential health services.

INDIA WATCH

Amid mounting fear over Omicron, an expert committee on Covid immunisation is considering recommending an "additional dose" to those who are immunocompromised or are elderly and at high risk of infection or death due to Covid-19 infection, an official source said. A final decision on the issue, however, will be taken by the National Technical Advisory Group on Immunisation next week, which will be then considered by the health ministry for approval. It would be too early as yet to speculate on just when the doses will be given.

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Spotlight

PARAG AGRAWAL New CEO of Twitter

Jack Dorsey stepped down as the CEO of Twitter on Monday, the social media site he co-founded in 2006 and navigated through the tumultuous years of the Trump administration. He has been replaced by Indian-origin Parag Agrawal, who as the company's chief technology officer had recently been working on technologies associated with cryptocurrencies, which have become a fascination of the tech industry's power brokers, including Dorsey. Dorsey will stay on the board of the San Francisco-based company until his term expires in 2022.



THE MAN

Parag, aged 37, is an alumnus of the Indian Institute of Technology, Mumbai, where he did his Bachelors in Engineering in computer science. He moved to the US for further studies, with his doctorate coming from Stanford University based in California

Parag joined Twitter in 2011. Before that, he briefly worked at Microsoft, AT&T and Yahoo. In all the three companies, his work was mostly research-oriented. Initially, at Twitter, he worked on ad-related products, but gradually he also dabbled in artificial intelligence



The world is watching us right now, even more than they have before. Lots of people are going to have different views and opinions about today's news. It is because they care about Twitter and future, and it's a signal that the wire we do here matter. Let's show the world Twitter's full potential

Parag Agrawal

Parag Agrawal joins elite club of Indian-origin CEOs



Parag Agrawal has joined the high-profile league of Indian and Indian origin honchos, who are calling the shots at global corporations. Agrawal joins Microsoft CEO Satya Nadella, Alphabet and Google CEO Sundar Pichai, Adobe President and CEO Shantanu Narayana and IBM Group CEO Arvind Krishna, who are currently leading global corporations. Besides, the elite club has other honchos like Mastercard's CEO Ajay Banga, Arista Networks' CEO and President Jaysree V Ullal, Micron Technology's CEO Sanjay Mehrotra and Reckitt Benckiser's CEO Laxman Narasimhan

'Spider-Man: No Way Home' to release in India a day ahead of US



Entertainment

'Spider-Man: No Way Home', the new Spider-Man film starring Tom Holland and Zendaya, is all set to release in India on December 16, a day ahead of its release in the US. "We have some exciting news for all the Spider-Man & Marvel fans! Our favourite superhero will be swinging in one day earlier than the US! Catch #SpiderManNoWayHome on December 16 in English, Hindi, Tamil & Telugu," tweeted Sony Pictures India.

In the film, with Spider-Man's identity now revealed, Peter asks Doctor Strange for help. When a spell goes wrong, dangerous foes from other worlds start to appear, forcing Peter to discover what it truly means to be Spider-Man

The film will also feature appearances from Benedict Cumberbatch as Doctor Strange, Jacob Batalon as Ned Leeds and Marisa Tomei as Aunt May

Lionel Messi Wins Record Seventh Ballon d'Or

Lionel Messi won the men's Ballon d'Or award for a record-extending seventh time at a ceremony in Paris on Monday. Messi won the last edition of the Ballon d'Or in 2019 before last year's awards were cancelled due to the pandemic.

HE ALSO WON IN 2009, 2010, 2011, 2012 AND IN 2015

The 34-year-old scored 38 goals in 48 games last season for Barcelona and won the Copa del Rey before captaining Argentina to Copa America glory in July. That was the first major international title of his glittering career, which had been spent entirely with Barcelona before his tearful departure from the Camp Nou in August and subsequent move to Paris Saint-Germain

He has now won the Ballon d'Or twice more than his old rival Cristiano Ronaldo - between them they have won 12 of the last 13 editions with the exception coming in 2018 when Luka Modric claimed the prize

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BOOK

Two Indians 'booked' for Emile Guimet Prize for Asian Literature 2021

Two Indians - Deepa Anappara and Geetanjali Shree - are among the five nominees for this year's 5,000 euro Emile Guimet Prize for Asian Literature for works translated into French, an award that is supported by the Oxford Book Store. The other nominees are Hideo Yakuda and Mitsuyo Kakuta from Japan and NG Kim Chew from Malaysia. The winner will be announced on January 20, 2022.

World's tallest railway bridge pier to come up in Manipur

The Indian Railways is constructing the world's tallest bridge pier (an upright support for a structure or superstructure) in Manipur. The ambitious project in Manipur is part of the 111 km-long Jiribam-Imphal railway line to connect the capital of Manipur with the broad gauge network of the country.

The bridge, which is being built at a pier height of 141 metres, will surpass the existing record of 139 metre of Mala - Rijeka viaduct, Montenegro in Europe. With the completion of the project, the 111 km distance will be covered in 2-2.5 hours. Presently, the distance between Jiribam-Imphal (NH-37) is 220 km, which takes about 10-12 hours of travelling. The work on the bridge will be completed by December 2023



COST

The project, which consists of 61 per cent of tunnels, will cost ₹ 374 crore approximately, according to the chief engineer



Beginning the journey of learning in an alphabetical order, Times NIE takes you through one concept from each subject every week



TEACHERS, IF YOU HAVE A CONCEPT THAT CAN CHANGE A CLASSROOM, SHARE IT ON

toinie175@gmail.com WITH YOUR PHOTOGRAPH

CLASSROOMS TO EXPERIENCE ZONES

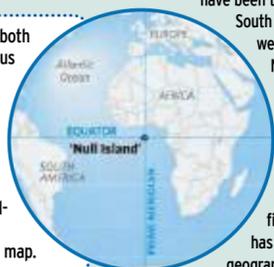
GEOGRAPHY

ZERO DEGREES

It is by pure coincidence that the coordinate of 0 degrees latitude, 0 degrees longitude falls in the middle of a little-known body of water,

The equator and prime meridian are both invisible lines on the Earth that help us navigate. Though invisible, the equator (0 degrees latitude) is a very real location that divides the world into two hemispheres. The prime meridian (0 degrees longitude), on the other hand, was created by scholars who needed reference point to begin noting east-west points on the map.

DID YOU KNOW?



about 380 miles south of Ghana and 670 miles west of Gabon. This location is in the tropical waters of the eastern Atlantic Ocean, in an area called the Gulf of Guinea. The Gulf of Guinea is part of the western edge of the African tectonic plate. Most notably, according to the theory of continental drift, this may have been the location where South America and Africa were once joined. Natural Earth GIS Data also added an imaginary island to the 0,0 location in 2011 known as the Null Island. Since its creation, through fiction, the 'island' has been given its own geography, flag, and history.

The Story Of Null Island

Very few people in the world will ever pass over the point where the Equator and Prime Meridian meet. It requires a boat and a good navigator, so, unlike the Prime Meridian Line in Greenwich, there is not much call for tourism at this location. The spot, also known as the Null Island, is marked with a weather buoy (Station 13010-Soul). It is placed at the exact location of 0 degrees latitude, 0 degrees longitude, and is owned and maintained by the Prediction and Research Moored Array in the Atlantic (PIRATA).



Source: Thoughtco

CHEMISTRY

ZEOLITES



Zeolites are microporous, aluminosilicate minerals. It is commonly used as commercial absorbents and catalysts. The name zeolite was given in 1756 by Swedish mineralogist Axel Fredrik Cronstedt. He called the material zeolite, from the Greek *zéo*, meaning 'to boil' and *lithos*, meaning 'stone'. Natural zeolites form where volcanic rocks and ash react with alkaline groundwater. Zeolites found in nature are almost never pure. They are contaminated by other minerals, metals, quartz, or other zeolites.

WHERE IS IT FOUND?

For many years, zeolite minerals were thought to be found only in vugs and fissures in volcanic rock. In the 1950s, however, zeolites were found in abundance in altered volcanic tuff in the western US and volcanogenic marine tuffs in Italy and Japan.



USES

Zeolites can be used in domestic and commercial water purification, water softening, and other uses. Zeolites were also found to help silver naturally emit light, which may compete with fluorescent lights or LEDs. Zeolites can be used to store solar heat harvested from solar thermal collectors. The largest use for zeolite is the global laundry detergent market.

FUN FACTS

- The name 'zeolite' is derived from Greek words meaning 'boiling stones' because the minerals frothed when heated to high temperatures.
- Zeolites give off heat when rehydrated. An old field test to determine if a rock sample contained zeolites was to see if a rock chip heated up when placed on the tongue.
- Zeolites adsorb ethylene and are used to prolong the shelf-life of vegetables and fruit, which emit ethylene as they ripen.
- Zeolites were used to adsorb radioactive isotopes from contaminated cooling water spilled at the Fukushima nuclear power plant after the plant was damaged in the March 2011 magnitude-9 earthquake in Japan.
- The maximum and minimum value of a function – local (within a limited range of the variables) or global (over the entire range of values). Finding maxima and minima is of great practical and scientific value, and it's the value of the function at which the slope is zero (and turns positive or negative thereafter). Indeed, the most important characteristics of non-linear functions is their slope, the continuously changing slope to be precise; the slope is the curve/function! To the point, calculus gives us the 'formula' for finding instantaneous rate of change. Once again, there is far more to calculus but this presents the key idea of calculus.

LANGUAGE

ZOOMORPHISM

By Kartik Bajoria
Jaipur-based
Communication Skills
Educator & Writer



Zoomorphism is an extremely interesting term. In fact, it is the opposite of a term called Anthropomorphism. In the latter, one assigns human qualities, traits or characteristics to animals. In the former, one takes animal traits and assigns them to non-animals (humans) or non-animal situations. It is essentially using animals, animal traits and behaviour in order to better describe a person or a situation.

The simplest way of understanding this is to call a friend who never has time, a BUSY BEE! Here, we have taken a very well established and classic attribute of the perennially hard-at-work Bee and used it to describe a person – thus making this a Zoomorphism. It is also very simple to remember, since the word 'Zoo' will always and instantly recall animals!

What is also very striking, particularly for students and fans and followers of Comics is that many superheroes are a physical manifestation of Zoomorphism – the obvious examples that immediately spring to mind include the iconic and beloved Spiderman, Batman, Antman, Catwoman and Black Panther. Now let us examine an example of Zoomorphism in terms of a relatable life situation. Read this sentence – Kartik's resignation ruffled many feathers in the company! The expression 'ruffled many feathers', which is used to communicate 'caught people's attention and made headlines' is a perfect example of a zoomorphism being used in a situational context. It would be a fun and immersive exercise to try and write down sentences of your own that use zoomorphism in people and situations.

ZINNIA



Zinnia is a genus of the family Asteraceae, containing about 20 species of annual and perennial plants, native primarily to North America with a few species in South America. The most popular species is 'Zinnia elegans', which is native to Mexico.

MATHS

By Sandeep Srivastava
Educator since 20 yrs, he
specialises in making
Maths easy and fun



ZERO (LIMIT, CALCULUS)

Perhaps half of modern math needs real numbers and continuity – the realities that are best addressed by calculus. Clearly, calculus can't even be introduced in an article. So, the scope of this article is limited to appreciating the unique need of calculus in quantifying 'real-world' things (natural, social, and even economics/management sciences), and conceptually equip readers to easily, and independently dig deeper in calculus if need be. Indeed, calculus is 'real analysis'.

The invention of calculus resolved one of the biggest challenges that mathematicians (and scientists) faced for nearly two millennia – how to correctly define and predict 'dynamic situations' (such as diffusion of gases/smoke/perfume, volume of a heap of something, stress points in skyscrapers and bridges, electric circuits with capacitors or inductors). The 'answers' given by calculus are so real that the need for what we call calculus was apparent in the development of the method of exhaustion around fifth century BCE. It may help to know that formal math education is significantly responsible for the 'tough' label attached to calculus. However, there is nothing intrinsic to calculus that actually requires trigonometry or any other difficult math. Indeed, the only real prerequisite to understand calculus is algebra.

Calculus is not just the omnipresent domain of math, it's an apt reminder of the superlative human thought. In math, it is matched only by Euclidean geometry (it was the first, and unparalleled foundation for a domain of knowledge by one man).

Zero made arithmetic move from abacus to page
There was no zero in abacus, but its design facilitated the arithmetic operations. The Roman numerals, used exclusively till mid of the second millennium in Europe, don't have zero as a numeral.

Power to people
Zero gave people power as they could do calculations without the need for an abacus (it needed training and practice to be used).

Power to Newton to start a 'new math'
No less revolutionary change due to zero was that it drove Isaac Newton, in the mid-17th century, to invent calculus. Newton used intuitively attractive idea of infinitesimal quantity that is not zero but nearly zero to calculate 'instantaneous' rate of change of things that are changing.

Welcome to the (dreadful) calculus
All things around us change over time, and calculus helps us describe how things change – their rate of change. For example, calculus helps us find instantaneous acceleration of a free-falling body (i.e., falling under gravity only); the body

experiences increasing acceleration every second. Calculus is also the way we find the length, area and volume of curved surfaces, objects, and spaces.

Math to the rescue of science

On the face of it science couldn't talk of instantaneous velocity or acceleration, when time and distance are nearly imperceptible, when there the physical measurement is a challenge. But math doesn't have limitation of 'smallest number possible', there is always a new real number between any two real numbers; mathematically expressing scientific realities allows much powerful analysis and computations. Math gifted science completely new possibilities – avoiding division by zero, using division by infinites and so on.

Calculus uses two inventive concepts – limit, and continuity – to find rate of change in quantities at any instant (and thus, instantaneous values of variable quantities) and to find magnitudes of quantities between two instants, or any other variable.

Daily life usage of math
Limited to numbers and arithmetic, very limited algebra if at all; for example, counting and discrete measurements of things 'money/speed/time, 'average speed over a time period', area and volume of objects such as cubes, cuboids, spheres, etc. A sad commentary of the 'math in our lives' – we hardly deal with 'continuous quantities' (i.e., those changing at all times and by unknown amounts) in everyday routine, it is all about discrete quantities (i.e., those changing in expected/know quantities, at expected/know times). Thus, constant rate of change, at least over a discrete period, i.e., linear variation is all that we know. Science and technology is still limited to a minuscule proportion of population.

Functions
Functions is what we use to mathematically describe these real world relationships. They are used to capture how we model change, how we 'see, know' change, away from the reality they represent.

It may be added that 'function' must not be new, or intimidating, because they are the broader category for algebraic expressions and equations. Polynomials are functions. **Functions are Input-Processing-Output** expressions specific to situations, and their output is ordered pairs (series of two numbers much like coordinate pairs); for example, the algebraic function for area of a square is x^2 and it generates ordered pairs – (side, area).

Functions – the two kinds
The world of polynomials we know are the one kind – discrete functions; this is the domain of algebra.

The other kind – continuous functions; variables and their values are continuous (variables such as acceleration of a vehicle, magnetic field of a piece of wire, etc. and these values are real numbers). This is the domain of calculus.

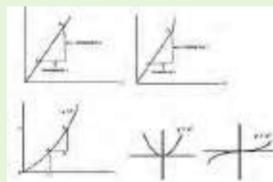
Algebra Versus Calculus – New knowledge on

Dimensions	Similarity	Differences
Measure slope of geometric figures	Both do	Algebra is for straight lines and calculus for curves
Measure length, area, and volume	Both do	Algebra is for straight lines, polygons, and some definite geometries and calculus is for curved shapes and objects
Measure direction, speed, distance, acceleration	Both do	Algebra is about rectilinear motion, 'average speed' and calculus is about curvilinear motion and instantaneous speed etc.
Measure work done by a force, mass of a body	Both do	Algebra is about constant density and force situations and calculus is about varying density and force situations
Dealing with functions	Both do	Algebra is about finding value of the function at a point and calculus its slope at any point

The complementary relationship of the two is writ large. No wonder algebra is the only true pre-requisite for calculus, for example, to be able to appreciate the idea and measurement of area, volume, acceleration, etc.

Two kinds of functions, graphically

The straight line functions carry a rate of change that is constant (except when the slope of the lines change, as is the second straight line graph after the point Q). The curved function shows a relationship when the rate of change is constantly changing – the slope of the graph is changing every instant'.



The slope of functions is very important

Slope of a function gives the rate of change of the function; it is best evaluated at a given point. It gives away the following simple information about a function (of course, there are more):

- The direction of change, increasing or decreasing.
- The degree of sensitivity of the dependent variable on the independent, i.e., the quantum of change in the former due to a small change in the later: For example, a slope of 4 at a point means the y-axis will grow 4 times the (small) change in x-axis.
- Determining if the rate is 0, or 1- two special relationships of the variables; and how fast the function may be approaching the value of 0.
- Compare any set of functions to know if they are parallel, perpendicular, or converging, and the rate of convergence.

BOTANY

ZANTEDESCHIA

Zantedeschia is a genus in the family Araceae, native to southern Africa. The genus contains 8 species and numerous cultivars of herbaceous perennials, divided into two main types: hardier outdoor forms with striking white flowers, called Arum Lilies, and the more tender forms with white-spotted leaves and colourful flowers, commonly known as Calla Lilies. Zantedeschia is widely popular and a beautiful addition to any garden. These plants can be grown in beds, borders, containers, but also in water (Zantedeschia aethiops).



Zygopetalum is a genus of about 15 species of flowering plants in the family Orchidaceae, native to South America. This plant produces waxy-looking, exotic patterned and coloured blooms. The blooms are



ZYGOPETALUM

strongly scented and have greenish-brown petals and sepals, and purple colour on their lips. These exotic orchids occur as both terrestrial and epiphytic, mainly in cooler high altitude regions.

ZEPHYRANTHES

Zephyranthes is a genus of about 90 species of flowering plants, mostly perennials, belonging to the Amaryllidaceae family. They are native to southeastern United States, Central America and South America.

These plants have grass-like foliage and erect flower stalks that support a single flower consisting of six or eight petals. The flowers are funnel-shaped and more often appears in spring and summer. These beautiful flowers range from yellow through pink to white and can fit in any garden. Some species have sweet fragrance which spread happiness and joy.

