The mentors Digest

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The mentors Digest

Our Founder and his Vision

Knowledge is the prime wealth among all wealths. In other words, knowledge is the best and important wealth among all wealths. Start your journey to find or explore the knowledge. Our founder and renowned scholar late Padmashri Dr Vellayani Arjunan's vision is to spread quality education to entire community and make it affordable.

Shri. Vellayani Arjunan was born on 10 February 1933 at Vellayani in the erstwhile Kingdom of Travancore. After receiving a Master of Arts degree in Malayalam, he went on to teach Malayalam Language and Literature at Sree Narayana College in Kollam. He later became the first Malayalam lecturer in Aligarh Muslim University, from which he gained his PhD degree in 1964.After leaving Aligarh Muslim University, he was appointed director of the State Institute of Encyclopaedic Publications in Kerala

Degree	Topic	Awarding Institution
D.Litt.	Influence of Sree Narayana Guru on Malayalam Poetry.	Aligarh Muslim University
D.Litt.	A Comparative Study of the Mutual Relations and Uniformity of Hindi and Malayalam Languages.	Agra University
D.Litt.	The influence of Hindi Vocabularies on the South Indian Languages: A Linguistic study.	Jabalpur University
Ph.D.	A Comparative Linguistic Study of Common Vocables of Hindi and Malayalam Languages.	Aligarh Muslim University

Other degrees

Degree	Subject
B.A. Hons	Malayalam Language and Literature
M.A.	Malayalam Language and Literature
M.A.	Hindi Language and Literature
M.A.	Hindi Special
P.G. Diploma	Tamil, Telugu, Kannada

He was honoured with the Padma Shri award by the nation in 2008. Dr Arjun, who was the first Professor of Malayalam at the Aligarh University and head of the Department of Modern Indian Languages. He supervised 20 research scholars and published more than 100 research papers and articles. He had authored 40 books in different genres including poetry, short story, essays and literary criticism, and his books were prescribed as textbooks in Kerala schools from 1959 onwards.

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From the Editor's Desk.....

Dear Students & future leaders,

Dr .A P J Abdul Kalam always encouraged students to be inquisitive. A famous Sanskrit quote reads thus, “Shraddhavan Labhate Gnanam”, meaning “Only the one with earnestness attains wisdom”. In the same lines, Dr Kalam enjoins the students to ask questions, which is a prerequisite to gaining knowledge. He says, “One of the very important characteristics of a student is to question. Let the students ask questions.”

Every child is born on the earth with a lot of dreams. As the child grows up, it endures the pressure from the parents, siblings, friends and the society that force it to fit into some pre-existing stereotypes. In the battle to be unique, only a few succeed while the rest lose the game and settle with what the world expects. Thus, society always ends up crippling man and thwarting his dreams to be original. Dr Kalam says, “While children are struggling to be unique, the world around them is trying all means to make them look like everybody else.” Here we can see the pains of a teacher who always wanted his students to be original and creative.

What is special about the month of July ?

Every year on **July 11, World Population Day** is commemorated to increase public awareness of concerns related to population growth. It is observed that the United Nations Development Programme created World Population Day in 1989, when there were 5 billion people on the planet. Its purpose, which has been to raise awareness of population control solutions.

According to UN Secretary-General Antonio Guterres," Sustainable Development 2030 agenda is the world's blueprint for a better future for all on a healthy planet. On World Population Day we recognize that this mission is closely interrelated with demographic trends including population growth, aging, migration, and urbanisation".

Population issue includes family planning, gender equality, child marriage, human rights, right to health, baby's health, etc. Therefore, World Population Day focuses on the importance of reproductive health and how it affects overall growth and development plans and programs.

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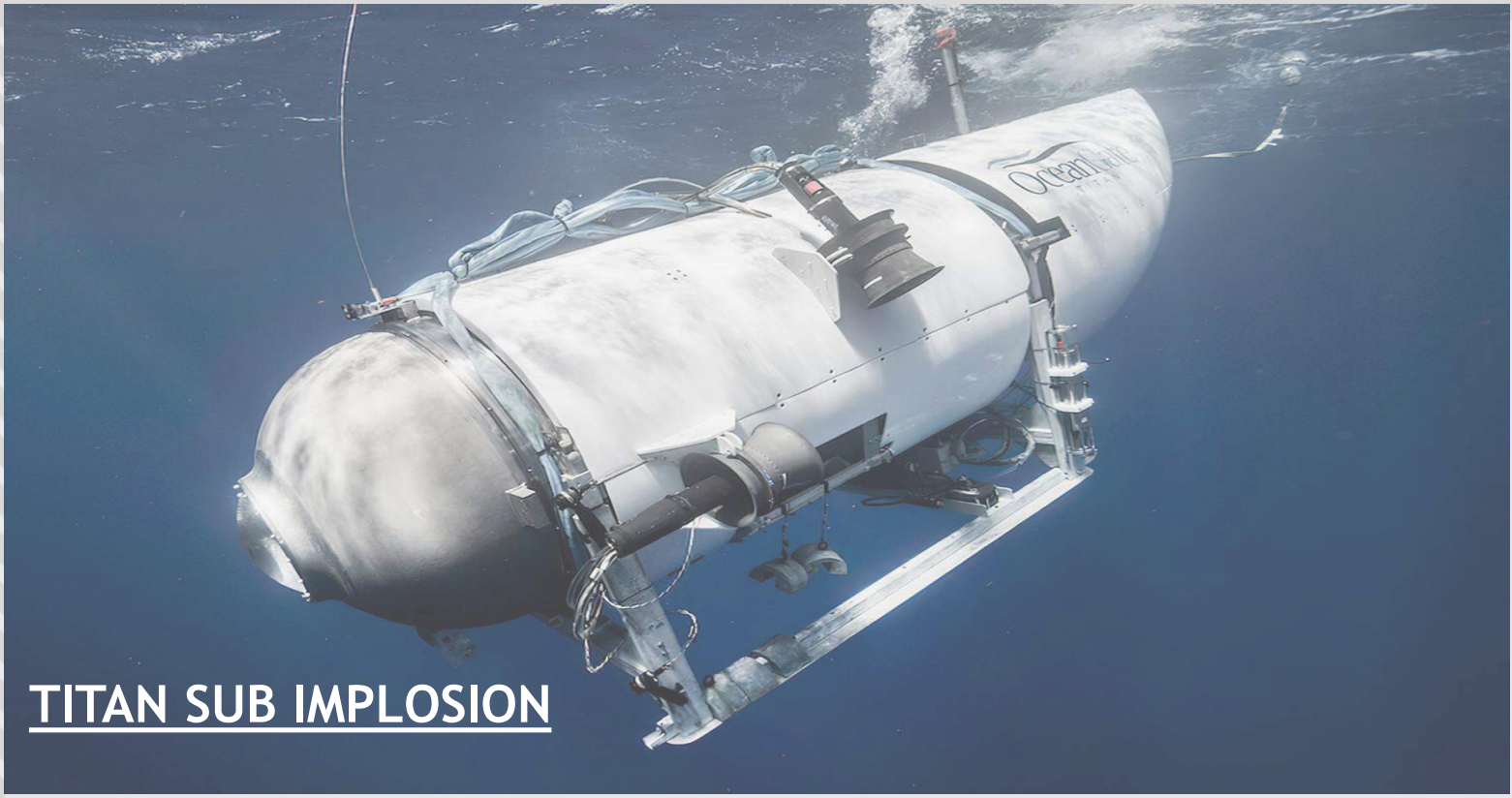

TITAN SUB IMPLOSION

WHAT?

The Titan submersible, a carbon-fibre and titanium vessel operated by Ocean Gate Expeditions, was on a mission to explore the Titanic wreckage in the Atlantic Ocean. The submersible weighed 23,000 pounds and had safety features to monitor its structural integrity. It also had 96 hours of life support and a gaming controller to steer it. However, it had limited amenities and the passengers had to sit cross-legged on the floor during the descent. The submersible was carrying five individuals, including the CEO and founder of Ocean Gate, a French diver, a British businessman, and a Pakistani billionaire and his son. On June 18, the submersible went missing near the Titanic site, leading to a week-long search operation to locate the vessel and its occupants.

WHEN?

The submersible lost contact with its support ship, the Polar Prince, approximately 1 hour and 45 minutes into the approximately 2-hour descent. The search teams located the debris field of the Titan submersible on June 25, leading to the declaration of the five individuals as deceased. This news captured the attention of millions worldwide and sparked controversy over the safety and ethics of such expeditions.

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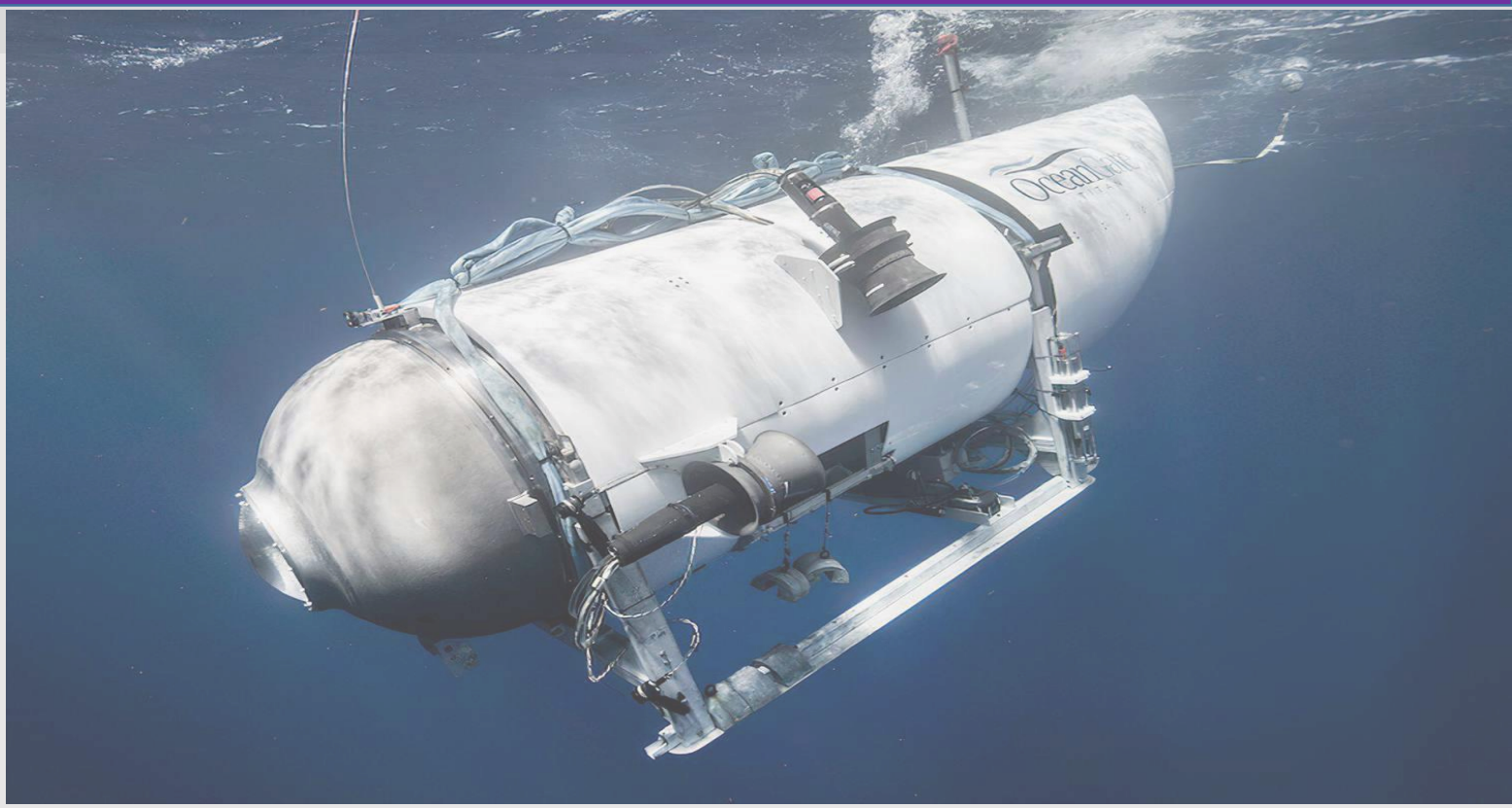
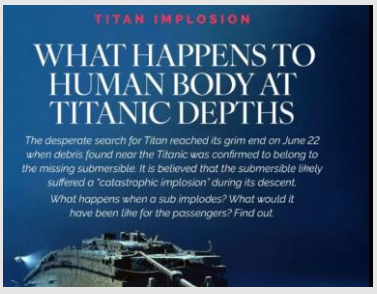
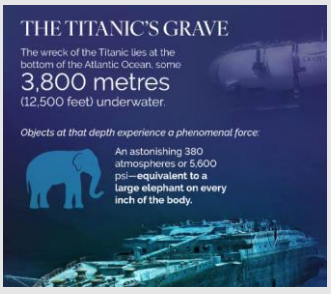
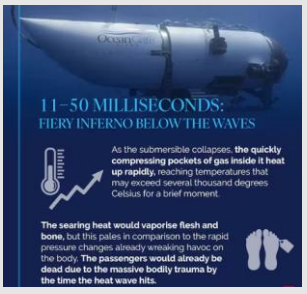


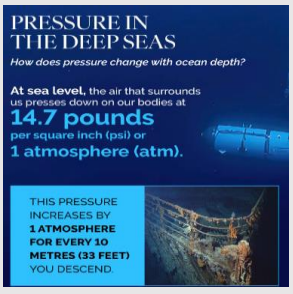
HOW?

According to the US Coast Guard, the Titan submersible experienced a catastrophic implosion while descending to the Titanic wreckage. This implosion refers to a sudden collapse of the vessel under immense pressure, in this case, the tremendous deep-sea water pressure at a depth of nearly 13,000 feet (almost 4,000 meters) in the North Atlantic Ocean. The sub's carbon-fibre hull was crushed due to the extreme pressure, resulting in the immediate death of all five passengers on board. The exact details of when and where the implosion occurred remain uncertain. Reports indicate that Ocean Gate had previously received warnings regarding the safety concerns associated with its voyages to the depths of the North Atlantic. The deaths of the five individuals aboard the Titan submersible raise questions and prompt further investigation into what exactly went wrong and the circumstances surrounding the implosion.









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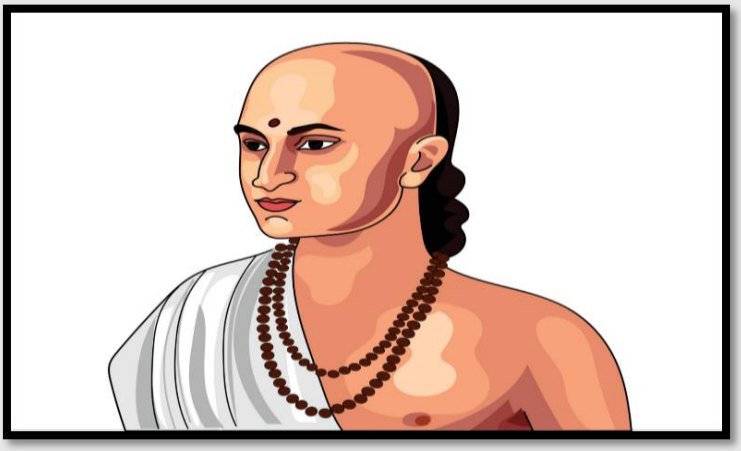
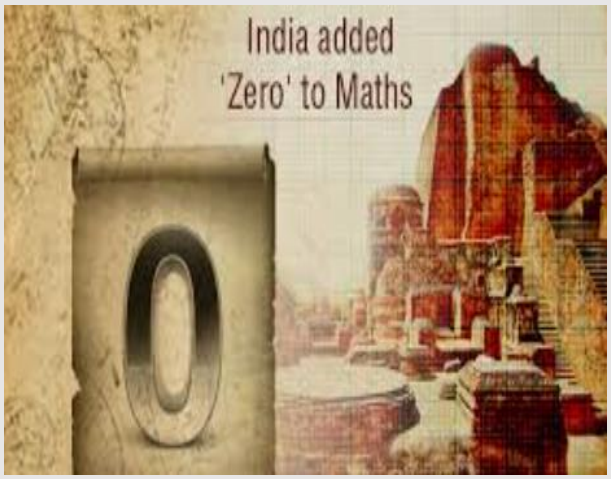
Mathematics

ARYABHATA: THE MAN WHO DISCOVERED ZERO



Aryabhata was an ancient Indian mathematician and astronomer who lived in the 5th century CE. He is considered to be one of the most significant mathematicians and astronomers of ancient India. He is the author of several important works, including the "Aryabhatiya" and the "Arya-Siddhanta



He made significant contributions to the field of mathematics, including the development of trigonometry and the use of decimals. He is also credited with the invention of the digit zero, which he used in his mathematical calculations. Aryabhata also proposed the concept of the rotation of the Earth on its own axis, and also suggested that the apparent motions of the stars were due to the rotation of the Earth, centuries before the first mention of this idea in the Western world.

VEDIC MATH TRICK OF THE MONTH

One of the effective Vedic maths tricks is to divide a large number by 5.
To find the answer for 16951/5:
Step 1: 16951 * 2 = 33902
Step 2: Move the decimal: 3390.2 or just 3390
To find the answer for 2112/5:
Step 1: 2112 * 2 = 4224
Step 2: Move the decimal: 422.4 or just 422
To find the answer for 4731/5:
Step 1: 4731 * 2 = 9462
Step 2: Move the decimal: 946.2 or just 946

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CHAPTER OF THE MONTH: SETS

Some Important Formulas: For any three sets A,B,C

- n(A U B)=n(A)+n(B)-n(A ∩ B)
- If A ∩ B = Φ, then n(A U B) = n(A)+n(B)
- n(A-B)+n(A ∩ B)= n(A)
- n(B-A)+n(A∩B)=n(A)
- n(AUB)=n(A-B)+n(A∩B)+n(B-A)
- n(A U B U C) =n(A)+n(B)+n(C)-n(A∩B)-n(B ∩ C)-n(C ∩ A)+n(A ∩ B ∩ C)

Other Important Sets Formulas

- n(U) = n(A) + n(B) + - n(A⋂B) + n((A∪B)')
- n((A∪B)') = n(U) + n(A⋂B) - n(A) - n(B)

Sets Formulas on Properties of Sets

Commutativity:

- A⋂B = B⋂A
- A∪B = B∪A

Associativity:

- A⋂(B⋂C) = (A⋂B)⋂C
- A∪ (B∪C) = (A∪B)∪C

Distributivity:

- A ⋂(B∪C) = (A ⋂B) ∪ (A⋂C)

Idempotent Law:

- A ⋂ A = A
- A ∪ A = A

Law of Ø and ∪:

- A⋂ Ø = Ø
- U ⋂ A = A
- A ∪ Ø = A
- U ∪ A = U

Sets Formulas of Complement Sets

- Complement Law :

  A ∪ A' = U, A⋂A' = Ø and

  A' = U - A
- De Morgan's Laws:

  (A ∪B)' = A' ⋂B' and

  (A⋂B)' = A' ∪ B'
- Law of Double complementation:

  (A')' = A
- Laws of Empty set and Universal Set:

  Ø' = U and U' = Ø

Sets Formulas of Difference of Sets

- A - A = Ø
- B - A = B⋂ A'
- B - A = B - (A⋂B)
- (A - B) = A if A⋂B = Ø
- (A - B) ⋂ C = (A⋂ C) - (B⋂C)
- A ΔB = (A-B) U (B- A)
- n(AUB) = n(A - B) + n(B - A) + n(A⋂B)
- n(A - B) = n(A∪B) - n(B)
- n(A - B) = n(A) - n(A⋂B)
- n(A') = n(∪) - n(A)

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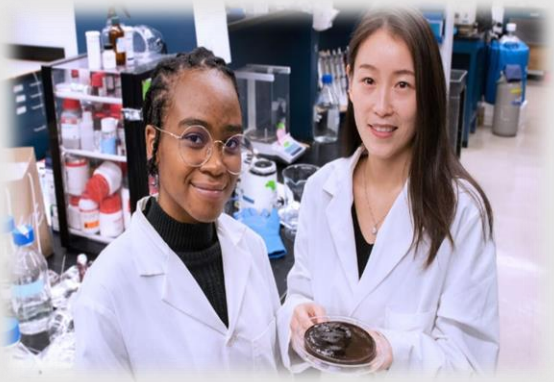
Science & Technology

A NEW SOLAR-POWERED GEL PURIFIES WATER IN A FLASH

Scientists have developed a remarkable new gel that has the ability to absorb and cleanse dirty water. This gel, called a hydrogel, is made up of threadlike molecules called polymers, which can soak up water like a sponge. Unlike regular hydrogels, this innovative gel is self-cleaning. When placed in polluted water, it selectively absorbs the water while blocking harmful substances like bacteria, oils, heavy metals, and salts. The gel's surface is coated with a special polymer net that repels oil and bacteria, making the contaminated water clean again. The filtered water can be extracted by simply allowing the gel to warm up in sunlight. This groundbreaking technology shows promise in providing clean and safe drinking water, potentially reducing the risk of water-related diseases that currently claim the lives of over 1.5 million people each year. Moreover, the gel's fast water absorption and release capabilities, inspired by the structure of a loofah, could have applications in robotics and other fields where controlled responses to temperature changes are desired. The use of sunlight as an energy source for this gel adds to its appeal, making it an environmentally friendly solution to water purification challenges.



SCIENCE FUN FACTS :

1. The human stomach can dissolve razor blades .

The pH level in the stomach ranges from 1-3 which is so strong that it can dissolve a single-edge blade in a few hours of immersion in the stomach acid, as found in a study.

2. Water can boil and freeze at the same temperature.

The temperature and the value of the pressure correspond to a point known as a triple point. At this point, the three phases, liquid, ice, and water vapor coexist which means that the water can boil and freeze at the same temperature.

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CHAPTER OF THE MONTH: MOTION IN A STRAIGHT LINE

Speed and Velocity

$$\text{Speed} = \frac{\text{distance(d)}}{\text{time (t)}}$$

- The unit of speed is m/s
- Its dimensional formula is $[M^0LT^{-1}]$

$$\text{Average speed} = \frac{\text{Total distance travelled}}{\text{Total time taken}}$$

If the particle covers distances s_1, s_2, s_3 ___ with speed v_1, v_2, v_3 ___ then:

$$\text{Average speed} = \frac{S_1 + S_2 + S_3 + \_\_\_\_}{\left(\frac{S_1}{V_1} + \frac{S_2}{V_2} + \frac{S_3}{V_3} + \_\_\_\_\right)}$$

$$\text{velocity} = \frac{\text{displacement (s)}}{\text{time (t)}}$$

- The unit of velocity is also m/s.
- It is vector in nature.
- Its dimensional formula is $[M^0LT^{-1}]$

$$\text{Average velocity} = \frac{\text{Total displacement covered}}{\text{Total time taken}}$$

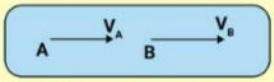
or $v_{avg} = \frac{x_2 - x_1}{t_2 - t_1} = \frac{\Delta x}{\Delta t}$

Relative Velocity

Relative velocity of the object A with respect to object B is:

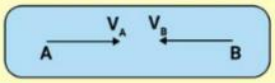
$$V_{AB} = V_A - V_B$$

When two objects are moving in same direction:



$$V_{AB} = V_A - V_B$$

When two objects are moving in opposite direction:



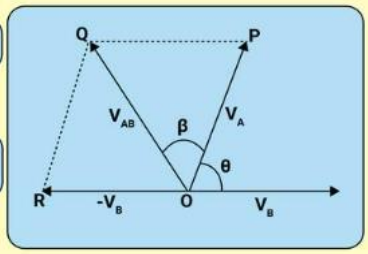
$$V_{AB} = V_A + V_B$$

When two objects move at an angle θ

$$V_{AB} = \sqrt{V_A^2 + V_B^2 - 2V_A V_B \cos\theta}$$

and

$$\tan\beta = \frac{V_B \sin\theta}{V_A - V_B \cos\theta}$$



Acceleration

$$\text{Acceleration} = \frac{\text{Change in velcoity } (\Delta v)}{\text{timeinterval } (\Delta t)}$$

- Its SI units is m/ s^2
- It is a vector quantity
- Its dimensional formula is $[M^0LT^{-2}]$

Average acceleration:

If a particle is accelerated for time t_1 with acceleration a_1 and for t_2 with acceleration a_2 then average acceleration is:

$$a_{avg} = \frac{a_1 t_1 + a_2 t_2}{t_1 + t_2}$$

Non - uniformly acelerated motion

For one - dimensional motion:

$$v = \lim_{\Delta t \to 0} \frac{\Delta s}{\Delta t} = \frac{ds}{dt}$$

The acceleration is given as:

$$a = \lim_{\Delta t \to 0} \frac{\Delta v}{\Delta t} = \frac{dv}{dt}$$
$$= \frac{d}{dt}\left(\frac{ds}{dt}\right)$$
$$= \frac{d^2s}{dt^2}$$

Instantaneous Speed, Velocity and Acceleration

$$\text{Inst. speed} = \lim_{\Delta t \to 0} \frac{\Delta s}{\Delta t} = \frac{ds}{dt}$$

Here, 'ds' is the small change in distance and 'dt' is the small change in time

$$\text{Inst. velocity} = \lim_{\Delta t \to 0} \frac{\Delta x}{\Delta t} = \frac{dx}{dt}$$

Here, 'dx' is the small change in displacement

$$\text{Inst. acceleration} = \lim_{\Delta t \to 0} \frac{\Delta v}{\Delta t} = \frac{dv}{dt}$$

Here, 'dv' is the small change in velocity

Kinematic Equations for Uniformly accelerated motion

The relation between the inital and final velocity:

$$v = u + at$$

Here, 'v' is the final velocity, 'u' is the inital velocity, 'a' is the acceleration and 't' is the time taken.

The relation between the displacement and the initial velocity:

$$s = ut + \frac{1}{2}at^2$$

Here, 's' is the displacement of the body.

The relation between the final and initial velocity along with displacement:

$$v^2 = u^2 + 2as$$

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ABOUT US

Affordable Quality education …….

By understanding the need of aspiring students, India's renowned Academic experts in the field of school education- Mr. Jayasankar Prasad (Son of **Late Padmasree Dr Vellayani Arjunan** and former Director Vivekananda group of schools) and Ms. Chitra Jayasankar (Educational advisor, Tagore Educational trust) are there to bridge the gap of ensuring quality education for the students. We have formulated an online platform for providing significantly exceeding educational experience through online tuitions (classes 8-12), IAS bridge programs and finishing school for fresh engineers and other professionals. We will ensure excellent learning experience to students and 100% satisfaction level to parents.

Interested parents who are willing to associate with this concept are requested to contact