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Karthik's L^AT_EX Assignment

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1 Our First Section

This section will completely consist text.

Here you will find some random information in the first section.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

My College URL: www.iitdh.ac.in

Our First Section Completed

2 Our (*Actually mine*) Mathematical Section

This is our mathematical section. It mostly consists of mathematics :)

2.1 Our First Mathematical Subsection

Our inline Mathematical Expression: $E = mc^2$

Our Non-Numbered equation in a dedicated line:

$$(a + b)^2 = a^2 + 2ab + b^2$$

Our Non-Numbered equation in a dedicated line in a second way:

$$(a + b)^2 = a^2 + 2ab + b^2$$

Our First Numbered equation in a dedicated line :

$$(a - b)^2 = a^2 - 2ab + b^2 \tag{1}$$

Our Multiline Equation: Area of Circle

$$\begin{aligned} A &= \pi r^2 \\ &= \frac{\pi d^2}{4} \end{aligned} \tag{2}$$

Matrices:

Matrix addition of A and B gives C.

$$\text{where } A = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{pmatrix} \text{ } B = \begin{pmatrix} 1 & 1 & 1 \\ 0 & 0 & 0 \end{pmatrix} \text{ and } C = \begin{pmatrix} 2 & 3 & 4 \\ 4 & 5 & 6 \end{pmatrix}$$

Square Root:

Do you know $\sqrt{4}$ is equal to 2.

Do you know $\sqrt{mc^2}$ is equal to \sqrt{mc} .

Summation:

$$\sum_{x=1}^n = n(n+1)/2$$

Integration:

$$\int_2^4 x = 6 + c$$

Nested Brackets with varying size:

$(\frac{1}{2})$ can also vary it's bracket size to $(\frac{1}{2})$

An example of multiple brackets is: $(a - b \cos(\frac{c}{d}))$

Fractions:

Do you know that the fraction $\frac{2}{4}$ is equal to $\frac{1}{2}$ and the value of it is 0.5. Here fraction is converted to the decimal value from numerator and denominator.

3 Tables

This is not a Dining Table!

The table number 3 shows teacher interacting with students in Google Meet interface.

Our Sir in Google Meet	Student A	
	Student B	
Student C	Student D	Student KARTHIK

Table 1: Google Meet Interface as a Table with Teacher

Students
A B

Table 2: Google Meet Interface without Teacher

The table number 3 shows students in Google Meet interface.

One Sample table:

Table 3: My Sample Table			
Value 1	Value 2	Value 3	Value 4
1	5	6	8
2	9	11	13
3	58	c	62

4 Information from Images

In Figure 1, We see one of the World’s Greatest Mathematicians **Aryabhata**.

Aryabhata is the author of several treatises on mathematics and astronomy, some of which are lost.

His major work, Aryabhatiya, a compendium of mathematics and astronomy, was extensively referred to in the Indian mathematical literature and has survived to modern times. The mathematical part of the Aryabhatiya covers arithmetic, algebra, plane trigonometry, and spherical trigonometry. It also contains continued fractions, quadratic equations, sums-of-power series, and a table of sines.

The Arya-siddhanta, a lost work on astronomical computations, is known through the writings of Aryabhata’s contemporary, Varahamihira, and later mathematicians and commentators, including Brahmagupta and Bhaskara I. This work appears to be based on the older Surya Siddhanta and uses the midnight-day reckoning, as opposed to sunrise in Aryabhatiya. It also contained a description of several astronomical instruments: the gnomon (shanku-yantra),

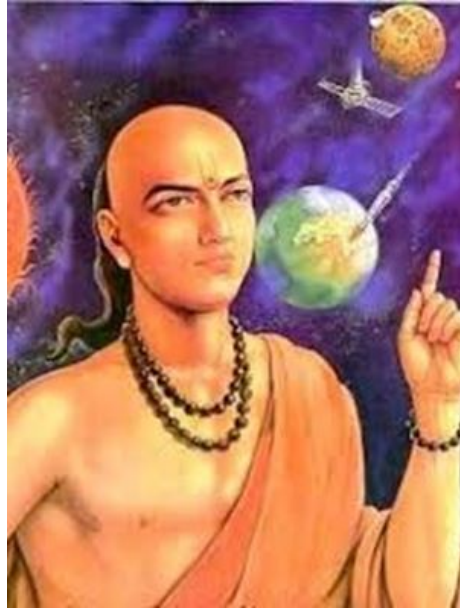


Figure 1: Aryabhata

a shadow instrument (chhAyA-yantra), possibly angle-measuring devices, semi-circular and circular (dhanur-yantra / chakra-yantra), a cylindrical stick yasti-yantra, an umbrella-shaped device called the chhatra-yantra, and water clocks of at least two types, bow-shaped and cylindrical.

In Figure 2, We see one of the finest Indian Mathematicians Srinivasa Ramanujan.

Though he had almost no formal training in pure mathematics, he made substantial contributions to mathematical analysis, number theory, infinite series, and continued fractions, including solutions to mathematical problems then considered unsolvable. Ramanujan initially developed his own mathematical research in isolation: according to Hans Eysenck: "He tried to interest the leading professional mathematicians in his work, but failed for the most part. What he had to show them was too novel, too unfamiliar, and additionally presented in unusual ways; they could not be bothered".[4] Seeking mathematicians who could better understand his work, in 1913 he began a postal partnership with the English mathematician G. H. Hardy at the University of Cambridge, England. Recognizing Ramanujan's work as extraordinary, Hardy arranged for him to travel to Cambridge. In his notes, Hardy commented that Ramanujan had produced groundbreaking new theorems, including some that "defeated me completely; I had never seen anything in the least like them before", and some



Figure 2: Srinivasa Ramanujan

recently proven but highly advanced results.

5 Lists of Random Things

5.1 Mathematicians

You can see their info mentioned in the section 5.1

- Aryabhatta
- Srinivasa Ramanujan
- Euler
- Euclid
- Pythagorean

• **Karthik Kancharla, Yes it's me:)**

5.2 Top Telugu Movies

1. Baahubali 1

2. Baahubali 2
3. Sarileru Neekevvaru

5.3 Super Heroes with cross referencing

Iron Man Wears an iron man suit. Iron man suit works due to following formula mentioned in equation number 1 calculated by famous mathematician in figure 1

Thor Doesn't wear an iron man suit, because he doesn't like it due to the formula mentioned in equation number 1 calculated by famous mathematician in figure 2

6 Info about References

This reference number [1] is a good article, it is the first article I found on web. It's very interesting.

This reference number [2] is the second article about science.

Also the article in reference [3] is also a good article on science to read in this pandemic, try it for sure.

The articles in the references [4] and [5] correspond to the latest information about covid vaccines and cures correspondingly.

7 Quick Sort Algorithm

This doesn't come into sub section 5.3 and here we don't discuss about super heroes. Pseudo code of Quick Sort Algorithm goes as follows:

It contains 2 functions: Pseudo Codes of both the functions are as follows.
low is starting index, high is ending index, pi is partition index.

This function takes last element as pivot, places the pivot element at its correct position in sorted array, and places all smaller (smaller than pivot) to left of pivot and all greater elements to right of pivot.

```
function QUICKSORT( $arr[], low, high$ )
  if  $low \leq high - 1$  then
     $pi \leftarrow$  PARTITION( $arr, low, high$ )
    QUICKSORT( $arr[], low, pi - 1$ )
    QUICKSORT( $arr[], pi + 1, high$ )
  end if return
end function
```

```

function PARTITION( $arr[]$ ,  $low$ ,  $high$ )
     $pivot \leftarrow arr[high]$ 
     $i \leftarrow (low - 1)$ 
    for  $j \leftarrow low; j \leq (high - 1); j \leftarrow j + 1$  do
        if  $arr[j] \leq pivot - 1$  then
             $i \leftarrow i + 1$ 
            SWAP( $arr[i]$ ,  $arr[j]$ )
        end if
    end for
    SWAP( $arr[i + 1]$ ,  $arr[high]$ )
    return ( $i + 1$ )
end function

```

References

- [1] A. Bruchez, K. Sha, J. Johnson, L. Chen, C. Stefani, H. McConnell, L. Gaucherand, R. Prins, K. A. Matreyek, A. J. Hume, E. Mühlberger, E. V. Schmidt, G. G. Olinger, L. M. Stuart, and A. Lacy-Hulbert, “Mhc class ii transactivator ciita induces cell resistance to ebola virus and sars-like coronaviruses,” *Science*, 2020.
- [2] A. Kornbluth, M. Kissous-Hunt, J. George, and P. Legnani, “Management of Inflammatory Bowel Disease and COVID-19 in New York City 2020: The Epicenter of IBD in the First Epicenter of the Global Pandemic,” *Inflammatory Bowel Diseases*, 09 2020. iza212.
- [3] N. Keller, F. Chantrel, T. Krummel, D. Bazin-Kara, A. L. Faller, C. Muller, T. Nussbaumer, M. Ismer, A. Benmoussa, M. Brahim-Bouna, S. Beier, P. Perrin, and T. Hannedouche, “Impact of first-wave COroNaVirus disease 2019 infection in patients on haemoDIALysis in Alsace: the observational COVIDIAL study,” *Nephrology Dialysis Transplantation*, vol. 35, pp. 1338–1411, 09 2020.
- [4] C. Collins, “Productivity in a pandemic,” *Science*, vol. 369, no. 6504, pp. 603–603, 2020.
- [5] H. H. Thorp, “A dangerous rush for vaccines,” *Science*, vol. 369, no. 6506, pp. 885–885, 2020.

All Sections Completed and All Tasks Done.

First some pages are specifically set to white because I don’t like coloured pages in my Document.