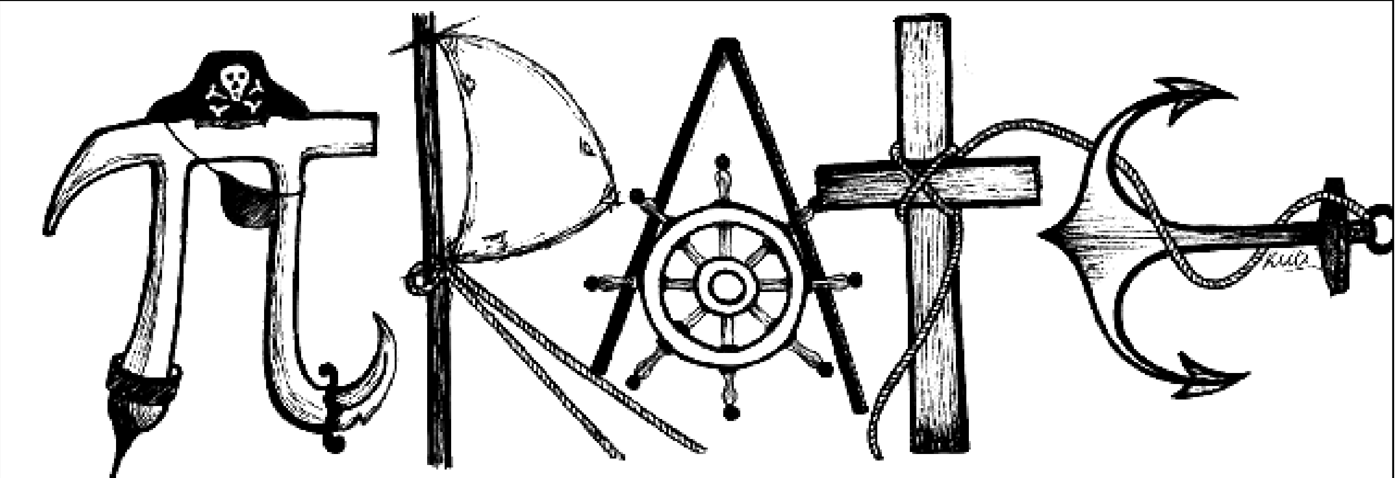


"The mathematical sciences particularly exhibit order, symmetry and limitation; and these are the greatest forms of the beautiful." -Aristotle

Editors' Note

December,2017

Dear Readers,

On the occasion of 60th Annual Sports Day, Pirate brings to you an edition which focuses on the role geometry and symmetry play in our lives and how all the laws of nature are governed by it.

The newsletter gives a glimpse of the infinity environment and has a lot of mind boggling riddles and puzzles for you to solve. It is our humble attempt to make you see the pattern in everything, be it a Mathematics or a real life problem.

Be real, be rational.
-Poorvi Parakh, Reddhi Poddar, Sreshti Goel.

Speed Mathematics

When multiplying large numbers, if one of the numbers is even, divide the first number in half, and then double the second number. This method will solve the problem quickly. For instance: 20 x 120

Step 1: Divide 20 by 2, which equals 10. Double 120, which equals 240.

Step 2: Then multiply your two answers together.

10 x 240 = 2400

The answer to 20 x 120 is 2,400.

CONTENT

INFINITY

As I stepped into the Infinity Environment on a Wednesday morning, I heard faint gasps from those around me. With apprehension, we entered a stark white, brilliantly lit room with no edges. The curved walls and angled lighting minimized shadows, giving the illusion that we were staring into a continuum. With no visual reference points anywhere in the room, my eyes flickered about, desperate for something to focus on; it was impossible to tell how far space extended, if at all. In seeming infinite, space ceased to exist beyond my eyelashes and nose.

The Infinity Environment, an art piece by Doug Wheeler, is currently on display at the David Zwirner Gallery in New York City. It's an artist's valiant effort to realize infinity, a concept that has been known to humanity for thousands of years, but, for most of us, remains difficult to grasp. Ancient Indian philosophers understood it as the entity from which a part can be removed, or another part added, only to have it remain the same. The ancient Greeks conceived of it as the boundless set of prime numbers. Both are true descriptions, but neither evokes a visceral understanding of the true nature of the beast.

The most famous paradox regarding infinity is Hilbert’s paradox of the Grand Hotel. The paradox presents us with a hotel with an infinite number of rooms and an infinite number of guests. When another guest arrives, the hotel owner can ask the guest in room number one to move to room number two, and the guest in room number two to move to number three, and so on, allowing the new arrival to move into room number one. The paradox states that one can fit infinite number of guests in the hotel because of the infinite number of rooms. If the rooms are full, then there is a last room, which means that the number of rooms is countable.

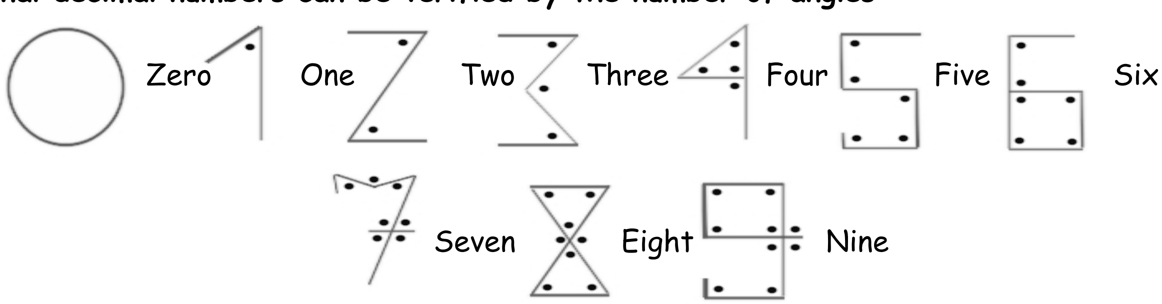
The trick to understand this riddle is to understand that infinity is NOT a number but a concept.

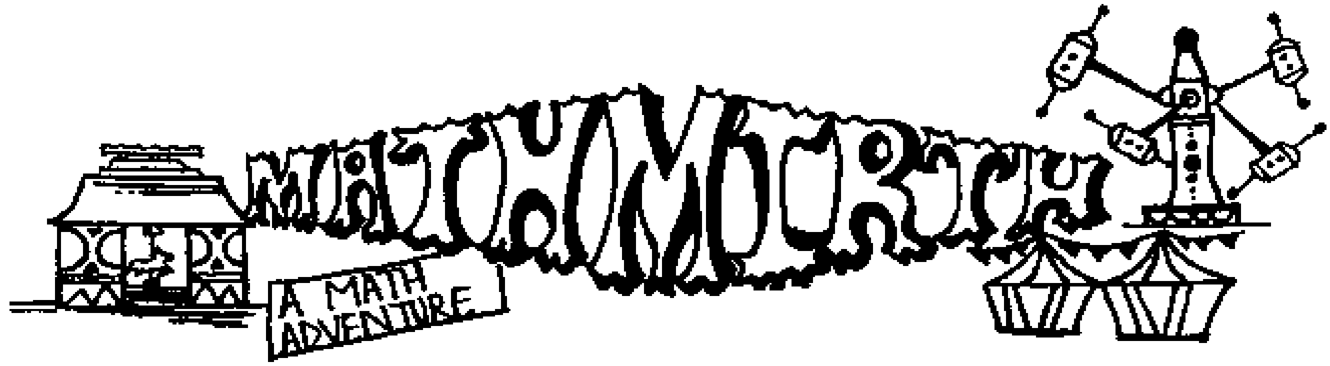
-Sreshti Goel
Class-12

Facts

1. **Prime spirals:** In 1963, mathematician Stanislaw Ulam noticed an odd pattern while doodling in his notebook during a presentation. When integers are written in a spiral, prime numbers always seem to fall along diagonal lines. This in itself wasn't so surprising, because all prime numbers except for the number 2 are odd, and diagonal lines in integer spirals are alternately odd and even.

2. **Original decimal numbers can be verified by the number of angles:**





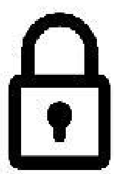
		θ	μ				π	δ
	β			θ		λ		
λ			δ		β			
							α	
θ	δ			β	μ	γ	ε	
	π		ε		α			β
δ		β	θ		γ			ε
				α				γ
μ		π				α	β	

SUDOKU

Fill a 9x9 grid so that each column, each row, and each of the nine 3x3 boxes (also called blocks or regions) contain the symbols

α,β,γ,δ,ε,θ,λ,μ,π.

WILL YOU CRACK THE CODE ?



CODE

6	8	2	One number is correct and well placed
6	1	4	One number is correct but wrongly placed
2	0	6	Two numbers are correct but wrongly placed
7	3	8	Nothing is correct
8	7	0	One number is correct but wrongly placed

Riddles:

1. There are 2 ducks in front of 2 other ducks. There are 2 ducks behind 2 other ducks. There are 2 ducks beside 2 other ducks. How many ducks are there?
2. Find three positive whole numbers that have the same answer added together or when multiplied together.

Solutions:

Sudoku-

α	ε	θ	μ	γ	λ	β	π	δ
π	β	δ	α	θ	ε	λ	γ	μ
λ	μ	γ	δ	π	β	ε	θ	α
β	λ	ε	γ	δ	θ	μ	α	π
θ	δ	α	π	β	μ	γ	ε	λ
γ	π	μ	ε	λ	α	θ	δ	β
δ	α	β	θ	μ	γ	π	λ	ε
ε	θ	λ	β	α	π	δ	μ	γ
μ	γ	π	λ	ε	δ	α	β	θ

Code: 042

Riddles:

1. Four ducks in a square formation.

* *
* *

2. 1,2,3. (1+2+3=6) (1*2*3=6)

Careers in Mathematics

Architects: Architects use mathematics for several reasons, leaving aside the necessary use of mathematics in the engineering of buildings. Firstly, they use geometry because it defines the spatial form of a building. Secondly, they use mathematics to design forms that are considered beautiful or harmonious

Animator: It allows the animator to find unknowns from a simple set of equations and to work out aspects of geometric figures when you are dealing with objects that move and change. An animator uses linear algebra to show the way that an object is rotated and shifted and made larger and smaller—all major actions in animation.

Forensic scientists: Forensic scientists analyse the evidence found in and around the crime scene, in search of clues pointing to a possible suspect, cause of death or other key piece of information. Math is used to determine how crimes are committed, when they were committed, and even who committed.

Symmetry

Sunflower

Zebra

Snowflake

Mc Donald logo

Fidget Spinner

Batman logo

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