

Cheenta
Passion for Mathematical Science
Problem Solving marathon

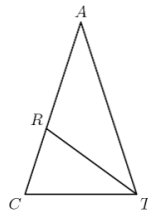
Instructor's Name: Ashani Dasgupta
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- The Set comprises three levels of questions as following-
Level 0- for Class **III-V**
Level 1- for Class **VI-VIII**
Level 2- for the rest
 - You have to write the answers on paper, take clear pictures, and upload them as image file on Google Classroom, in which you are assigned.
 - You may contact Shubhadip Ghosh through Skype
 - Solve as much as you can, even if you cannot solve fully write whatever your idea is.

1 Level 0

Q.1) In triangle CAT , we have $\angle ACT = \angle ATC$ and $\angle CAT = 36^\circ$. If \overline{TR} bisects $\angle ATC$, then $\angle CRT =$



Q.2) What is the product of $\frac{3}{2} \times \frac{4}{3} \times \frac{5}{4} \times \dots \times \frac{2019}{2018}$?

2 Level 1

Q.1) How many 7-digit palindromes (numbers that read the same backward as forward) can be formed using the digits 2, 2, 3, 3, 5, 5, 5?

Q.2) How many pairs of positive integers (a,b) are there such that a and b have no common factors greater than 1 and:

$$\frac{a}{b} + \frac{14b}{9a}$$

is an integer?

3 Level 2

Q.1) Prove that if m, n are integers, then the expression

$$E = m^5 + 3m^4n - 5m^3n^2 - 15m^2n^3 + 4mn^4 + 12n^5$$

cannot take the value 33.