CA THE INSTITUTE OF CHARTERED ACCOUNTANTS OF SRI LANKA

60 DIAMOND JUBILEE

Sri Lanka Olympiad Mathematics Foundation

CHANAKYA'S MIND GAMES

#2

"Way oh way oh, way oh way oh …
Walk like an Egyptian …"

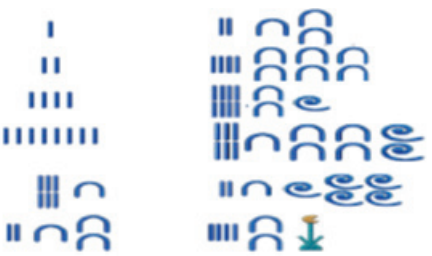
Even better. Let's multiply like an Egyptian in the time of Pharaohs. They used a continual doubling process to multiply. Let's look at an

Example: Multiply 42 by 32.

1	32
2	64
4	128
8	256
16	512
32	1024

In the left column continual doubling starting from 1 and in the right column continual doubling starting from one of the numbers, say 32. Then Since 42 = 2 + 8 + 32, 42 x 32 = (2 + 8 + 32) x 32 = 64 + 256 + 1024 = 1344.

So to multiply 25 by 32 we simply add numbers in the right column that are in rows 1, 4 and 5: 25 x 32 = 32 + 256 + 512 = 800. This is because 25 = 1 + 8 + 16. To multiply 28 by 32 we add numbers in the right column that are in rows 3, 4 and 5 since 28 = 4 + 8 + 16. Now, the above two columns in the multiplication of 42 by 32 appears in Hieroglyphic numerals as follows



Mind Game # 2

How many different positive integer multiples of 32, including 1 by 32 and 42 by 32, can be calculated using the above two columns and the ancient Egyptian method of multiplication?

Mind Games are published every fortnight on Sundays. Send your detailed solution on or before December 7, 2019 with your full name, postal address, age, name of school (& grade) or university or occupation by post to:
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or email to: cjw@maths.cmb.ac.lk
For each Mind Game, the eight best solutions will be awarded a gift voucher worth Rs. 1000 each from CA Sri Lanka.
Solutions to the Mind Games and names of the winners will be published in www.slmathsolympiad.org and www.casrilanka.com

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