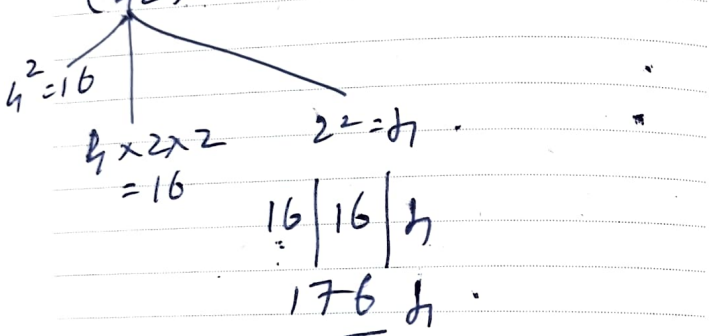
MATHEMATICS - TRICKS

1) SQUARE OF A NUMBER.

a) Square of a 2-digit no.

$(42)^2$.



16 | 16 | 4

1764 .

Steps: 1) Divide 42 into 3 branches.

2) Left most branch shows the square of the leftmost number.

3) Rightmost branch shows the square of the rightmost number

4) Middle branch shows the multiplication of three numbers.

5) Divide the answer that you get from the three branches into 3 slots.

eg: 16 | 16 | 4 .

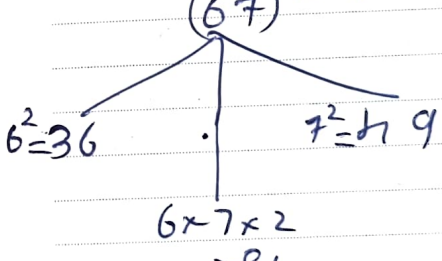
Now, in the unit's place, write the rightmost number 4.

In the ten's place write 6 and carry forward 1.

In the hundredth place, write 16+1 = 17

b) Similarly, find the square of 67.

$(67)^2$



36 | 84 | 49

4489 .

c) Alternative method for the square of a 2-digit no.

$(42)^2$:

$4^2 = 16$ $\qquad$ $2^2 = 04$

×1 $\qquad$ 6×

$\qquad$ 64

17

= 1764

Steps:

1) Divide 42 into 2 branches.
2) Leftmost branch gives the square of the leftmost number
3) Rightmost branch gives the square of the rightmost number.
4) Now, 4×2×2 = 16. Write this no below leaving the leftmost & the rightmost position. You have to write 16 in the middle.
5) Add the number.

d) $(67)^2$

$6^2 = 36$ $\qquad$ $7^2 = 49$

×8 $\qquad$ 4×

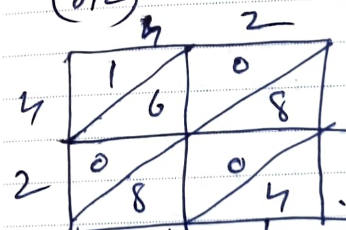
44 $\qquad$ 89

= 4489

You got 84 by $(6 \times 7 \times 2)$.

e) Another method for the square of a 2 digit no.

$(42)^2$



Steps: Since there are 2 digits. Draw a (2×2) table.

1) Write 42 row wise & column wise.
2) Multiply row1 × column1, row 2 × column1 & so on.

1 | 0+6+4 | 8+8 | 4

= 1 | 6 | 16 | 4 = 1764

3) Draw the crossed lines
4) Support in Row 1 & Column 1. for 4×4=16, write 1 in the upper slot & 6 in the lower slot.
5) Similarly for row 1 & Column 2 for 4×2=08, write 0 in the upper slot & 8 in the lower slot.
6) You have to express 8 as 08 since it is a (2×2) table.

7) Finally, add the numbers diagonally.
eg:

1	0+6+0	8+0+8	4
1	6	16	4

= 1764

f) Another method for finding the square of a number.

97^2

97 × 97
(+3) (-3)

= 100 × 94
= 9400
= $9400 + 3^2$
= 9409

Ex:
1) 97 is close to 100. So add 3 & subtract 3 to balance the equation.
2) Calculation becomes much easier.
3) (97+3) = 100 & (97-3) = 94
So, 94 × 100
= 9400.
4) Add $3^2 = 9$ to 9400
5) Answer is 9409.

g) square of a 3-digit number

$(173)^2$.

$= (14|3)^2$.

196 | $14 \times 3 \times 2 = 84$ | $3 \times 3 = 9$.

196 | 84 | 9

20449

Steps:

1) Divide 173 into 2 numbers 14 93.
2) The leftmost branch gives the square of the leftmost number 14^2.
3) The rightmost branch gives the square of the rightmost number 3^2.

4) The middle branch gives $14 \times 3 \times 2 = 84$.

5) Now, the answers that you get has to be divided into slots.

196 | 84 | 9.

The unit's place is 9.

The ten's place is 4 because 8 is carried forward

The hundredth place becomes $196 + 8 = 204$.

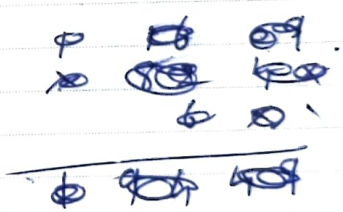
6) So, the answer is 20449.

h) Alternative method.

$(14|3)^2$.

$14^2 = 196$ | $14 \times 3 \times 2$ | $3^2 = 9$.

So, we get



196 09
× 8 4 ×
2044 9

Steps:

1) Divide 143 into 2 branch
14/3.

2) Leftmost branch give
$14^2 = 196$

3) Rightmost branch give
$3^2 = 09$.
You have to express 9
as 09

4) And then multiply
$14 \times 3 \times 2 = 84$ and write
it below the number in
such a way that the
rightmost position is empty

5) Finally, added the
number.

i) Another method $(143)^2$.

	1	4	3
1	01	04	03
4	04	16	12
3	03	12	09

0 | 1 | 9 | 14 | 4 | 9

20449

Rows are horizontal
Columns are vertical.
If I write (3×3), it means
there are 3 rows & 3 columns

Steps: 1) Since there are 3
digits in 143, draw a
(3×3) table.
2) Write 1, 4, 3 on the outside
of row & column.

3) Multiply & enter the value in the table.
For eg: in the 1st row 9.
1st Column, we get 1×1 = 01.
1 is to be expressed as 01.

write 0 in the top slot and 1 in the bottom slot.

4) After multiplication add the numbers diagonally. →

For eg: in the lowest diagonal, it is 9.
and in a diagonal above that, 2+0+2=4.
and so on.

5) After doing addition & writing it slot wise. you get the number?
0|1|9|14|4|9.

write 9 as it is in the rightmost position
Before that, write 4 as it is and row for 14, write 4 and carry 1 to the next slot.
Then 9+1=10, so write 0 & carry 1 to the next slot.
1+1=2
So, the answer is 20,449.

j) Another method.

$(197)^2$

197 × 197
(+3) (−3)

= 200 × 194 . 3^2
= 38800 + 9
= 38809

27 MARCH

Monday

2017

Another method of finding Square:

1) $(43)^2$

$4^2 = 16$ $\quad$ $3^2 = 09$.

$4 \times 3 \times 2 = 24$

28

Tuesday

So, 1609
24
1849

2 Digits

Steps: 1) Find the leftmost no i.e $4^2 = 16$.

2) Find the rightmost no. i.e $3^2 = 09$.

3) Find the middle no i.e $4 \times 3 \times 2 = 24$.

4) Write 24 leaving one position in the right

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
19	20	21	22	23	24	25

Sun	Mon	Tue	Wed	Thu	Fri	Sat
5	6	7	8	9	10	11
26	27	28	-	-	-	-

MARCH 29

Wednesday

2017

2) $(518)^2$

$5^2 = 25$ $\quad$ $18^2 = 324$.

$5 \times 18 \times 2 = 180$.

So, 250324
180
268324

Answer is: 268324

30

Thursday

Steps: 3 digit number

1) Find the leftmost no if $5^2 = 25$

2) Find the rightmost no if $18^2 = 324$

3) Find the middle no i.e $5 \times 18 \times 2 = 180$

4) Write 180 ~~or~~ leaving two positions from the right.

5) Also, express 324 in 3 digits.

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
16	17	18	19	20	21	22

Sun	Mon	Tue	Wed	Thu	Fri	Sat
2	3	4	5	6	7	8
23	24	25	26	27	28	29

Sun	Mon	Tue	Wed	Thu	Fri	Sat
9	10	11	12	13	14	15
30	-	-	-	-	-	-

2017

3) $(1729)^2$

$17^2 = 289$ $\quad$ $29^2 = 841$

$17 \times 29 \times 2 = 986.$

$$\begin{array}{r} 2890841 \\ 986 \\ \hline 2989441 \end{array}$$

So, the cube is 2989441.

For 4 digit numbers

Step 1: Find the leftmost no i.e 17^2

2): Find the rightmost no i.e 29^2.

3) Find the middle no. i.e $2 \times 17 \times 29 = 986$

4) Write 986 leaving 2 positions from the right

5) Also, express 841 in 3 digit

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

Sun	Mon	Tue	Wed	Thu	Fri	Sat