14 × 14 = 196
17 × 17 = 289
16 × 16 = 256
18 × 18 = 324
25 × 25 = 625

Pre Request

Yeah Sab learn karo

- Square of 1 to 50 (or 1 to 100)
- Cubes of 1 to 20 (or 1 to 40)
- Tables of 1 to 30 (or 1 to 50)
- Prime number from 1 to 200 (or 1 to 500)

1. Maths to learn Squares
2. Table
3. Square TRICK
4. Multiplication

$21 = [4\ 1]$	1+9	21 = 41	$21^2 = 441$
$22^2 = [4\ 4]$	2+8	22 = 84	$22^2 = 484$
$23^2 = [5\ 2\ 9]$	3+7	23 = 29	$23^3 = 529$
$24^2 = [5\ 7\ 6]$	4+6	24 = 76	$24^2 = 576$
$25^2 = [6\ 2\ 5]$	5+9	25 = 25	$25^2 = 625$
$26^2 = [6\ 7\ 6]$	4		$26^2 = 676$
$27^2 = [7\ 2\ 9]$	3		$27^2 = 729$
$28^2 = [7\ 8\ 4]$	2		$28^2 = 784$
$29^2 = [8\ 4\ 1]$	1		$29^2 = 841$
$30^2 = [9\ 0\ 0]$			$30^2 = 900$

41
84
29
76

41 41
84 84
29 29
76 76

41
84
29
76

41
84
29
76

76
29

45^2 ⟹ $4+5=9$

$41 = 1681$	16	1+9	9^2	$16\,9^2$
$42^2 = 1764$	17	7+8	8^2	$17\,8^2$
$43^2 = 1849$	18	3+7	7^2	$18\,7^2$
$44^2 = 1936$	19	4+6	6^2	$19\,6^2$
$45^2 = 2025$	20	5+5	5^2	$20\,5^2$
$46^2 = 2116$	21	6+4	4^2	$21\,4^2$
$47^2 = 2209$	22	7+3	3^2	$22\,3^2$
$48^2 = 2304$	23	8+2	2^2	$23\,2^2$
$49^2 = 2401$	24	9+1	1^2	$24\,1^2$
$50^2 = 2500$	25	10+0	0^2	$25\,0^2$

50 ⟶ 25 ke bada hoy

$51^2 = 2601$

$52^2 = 2704$

$53^2 = 2809$

$54^2 = 2916$

$55^2 = 3025$

$56^2 = 3136$

$57^2 = 3249$

$58^2 = 3364$

$59^2 = 3481$

$60^2 = 3600$

$91^2 = 8281$

$92^2 = 8464$

$93^2 = 8649$

$94^2 = 8836$

$95^2 = 9025$

$96^2 = 9216$

$97^2 = 9409$

$98^2 = 9604$

$99^2 = 9801$

$100^2 = 10000$

M

Q $(ab)^2 = xyz$

$(ba)^2 = zyx$

find two such pairs?

Ans (12, 21)
(13, 31) {Ans}

(12, 24)
(13, 31)

Q $(N)^2 = APPP$

I^{st} $(a, b) = (12, 21)$
II^{nd} $(a, b) = (13, 31)$

find the value of $N + A + P$?

$(38)^2 = 1444$
$N = 38$, $A = 1$, 4
$= N + A + P$
$= 43$ Ans

Sol $N = \sqrt{APPP}$

$N =$

$\sqrt{APPP} + A + P$

$P\sqrt{AP} + A + P = P(\sqrt{AP} + A + 1)$

$(MN)^2 = APPP$
└ last 3 digit same

find $M + N + A + P = ??$

$\frac{P\sqrt{AP}}{N} + \frac{P\sqrt{AP}}{M} + A + P$

$= P\left(\frac{\sqrt{AP}}{N} + \frac{\sqrt{AP}}{M} + A + 1\right)$

$MN = \sqrt{APPP}$
$MN = P\sqrt{AP}$
$M = \frac{P}{N}\sqrt{AP}$

Sol

$(MN)^2 = APPP$

$(38)^2 = 1444$

$M+N+A+P = ??$

$3+8+1+4 = 16$ Ans

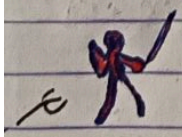
CUBES

$1^3 = 1$	$11^3 = 1331$
$2^3 = 8$	$12^3 = 1728$
$3^3 = 27$	$13^3 = 2197$
$4^3 = 64$	$14^3 = 2744$
$5^3 = 125$	$15^3 = 3375$
$6^3 = 216$	$16^3 = 4096$
$7^3 = 343$	$17^3 = 4913$
$8^3 = 512$	$18^3 = 5832$
$9^3 = 729$	$19^3 = 6859$
$10^3 = 1000$	$20^3 = 8000$

19
11

11 —— 19

1331



Short Trick To Create Table

86	8		6	
86 x 1 =	8		6	86
86 x 2 =	16	16+1	12	172
86 x 3	24	24+1	18	258
86 x 4	32	32+2	24	344
x 5	40	40+3	30	430
x 6	48	48+3	36	516
x 7	56	56+4	42	602
x 8	64	64+4	48	688
x 9	72	72+5	54	774
x 10	80	80+6	60	860

Table

29 table

29	2	9	29	9
	2	18	68	8
	4	27	87	3
	8	36	146	
	10	45	175	
	12	54	204	
	14	63	233	
	16	72	262	
	18	81	261	
	20	90	0	

29	174
58	203
87	232
116	261
145	290

Table of 37

37

3	7	74
6	14	111
9	21	148
12	28	185
15	35	222
18	42	259
21	49	296
24	56	333
27	63	370
30	70	

37
74
111
148
185
222
259
296
333
370

✓

37 x 3 table

37 x 3	= 111
37 x 6	= 222
37 x 9	= 333
37 x 12	= 444
37 x 15	= 555
37 x 18	= 666
37 x 21	= 777
37 x 24	= 888
37 x 27	= 999

Prime number between 1 and 200

2	3	5	7	11	13	17	19
23	29	31	37	41	43	47	53
59	61	67	71	73	79	83	89
97	101	103	107	109	113	127	131
137	139	149	151	157	163	167	173
179	181	191	193	197	199		

Square finding trick

Q $(103)^2$

$(100+3)^2$

$(100)^2 + (3)^2 + 2\times100\times3$

$10000 + 9 + 600$

10600

$\boxed{10609}$

Sir ji trick

103

03

106

+ 09 → $\boxed{10609}$ Ans

$(03)^2 = 09$

Q $(104)^2$

$(04)^2 = 016$

104

04

10816

10816

Q 107 (49)

107

07

11449

Q $(102)^2$

$(02)^2 = 04$

Iski phele digit dusne digit k last digit se add hoga these same for 2 and 3 digit of square

```
 102
  02
-----
10404
```

Q $(112)^2$

$(12)^2 = (144)$ — But we write in 2 digit format

```
 112
  12
-----
12(4)44
   1
-----
12544
```

Q $(113)^2$

$(13)^2 = 169$

```
 113
  13
-----
 126
   169
-----
12769 Ans
```

Q $(117)^2$

$(7)^2$

```
 17
 17
---
119
17×
---
289
```

```
 117
  17
-----
 134
   289
-----
13689 Ans
```

Q 145^2

$(45)^2 = 1936$ ✗
$= 2025$

```
 145
  45
-----
 190
  1936
-----
20936
```

$= 20836$ Ans

```
  190
 2025
-----
21025
```

81
64
49
36

$(16)^2 = (15)^2 + 16 + 15$

$(17)^2 = (16)^2 + 16 + 17$

$(P-1)^2 = y$

$(P)^2 = y + P + (P-1)$

$= 13$ Ans

$13^2 = 169$ $(P)^2$

$(12)^2 = 144$ $(P)^2 = 144 + 1$

$12 = 144$

$165 = 144 + 13 + (12)$

$169 =$

$(13-1)^2 = 144$

$(13)^2 = 169$

Formula

$(P-1)^2 = y$

$(P)^2 = y + P + (P-1)$

Num use ek phel ka num

$(14)^2 = 169 + 13 + 13$

$= 196$ Ans

169
13
13
196

$(15)^2 = 196 + 15 + 14$

$= 225$ Ans

196
29
225

$(15)^2 = 14^2 + 15 + 14$

$(14)^2 = 13^2 + 14 + 13$

ज्ञान . अमिता

Q

$38^2 = 1444$

$(39)^2 = 1444 + 38 + 39$

$= 1521$ Ans

38
39
77

1444
77
1521

E J O T
5 10 15 20

(999...9)

Q → TCS NQT 2020 2018

Consider the expression $(999\ldots9)^3$, if there are total of 2020 9's then find the following

(a) Total num of digits in the expression ..
(b) value of the expression ... ↳ Answer → Tell answer digits
(c) Digits sum... ↳ sum of them digit ↳ for 9 o se

$(9999\ldots9)^3$

↳ Total num of 9's = 2020

b

1 - 5°

Jitne 9 utne zero
↳ in output phle 9 likho then utne zero

Jitne 9 use ek kam 9

2 ka partner → 8

$(9)^2 = 81$

$(99)^2 = 9801$

$(999)^2 = 998001$

$(9999)^2 = 99980001$

$(99999)^2 = 9999800001$

$(999999)^2 = 999998000001$

for 2020 9's

$(9999\ldots9)^2 = 2019(9's)\,8\,2019(0's)1$

for 2020 9's

$2019 + 2019 = 4038$

Q. $(999\ldots9)^2$ = $\underbrace{999\ldots9}_{n=2019}\,8\,\underbrace{000\ldots01}_{2019}$

2020 times 9

a. Total num of digits = 4040

b. Value of expres = $\underbrace{9999\ldots9}_{2019}\,8\,\underbrace{000\ldots01}_{2019}$

c. Sum of expression $9+9+9+\ldots$ 2019

$= 9 \times 2019 + 8 + 1 + 0 \times 2019$

$= 18171 + 9 + 0$

$= 18,180$

$2019 \times 9 = 18171$; $18171 + 9 = 18180$

$2020 \times 9 = 18180$

Q. for $(999\ldots9)^3$

$9^3 = 729$

$99^3 = 970299$

$999^3 = 997002999$

$9999^3 = 999700029999$

$99999^3 = 999970000299999$

3 → partner 1, 7 → partner 2

$(9999)^3$ = jitne 9 ull ek kam 9, jitne 9 utne 0

$(9999)^3$ = 9997 0002 9999

2020
×2
6060

for $(9999\ldots9)^3$ =

(b) Expression

$(9999\ldots9) = (999\ldots9) 7 (00\ldots0) (33\ldots3)$
2019 2019 2020

(a) & Total sum of digit

$= 2019 + 2019 + 2020 + 2$

$= 6060$ Ans ✓

(c) Sum of digit

$= 2020 \times 9 + 2020 \times 9$

$= 9(2020 + 2020)$

$= 18180 + 18180$

$= 36360$

2020
×9
18180

2020
2020

18180
18180
36360

$= (999\ldots9) 7 (00\ldots0) 29 (99\ldots9)$
2019 2019 2019

$= 2019 + 2019 + 2020 + 2$

$= 6060$

= Sum of digit