SQUARE

21×21=441

21×21 is 21^2

First Method
Anurupyena (By ratio or propotionately)

(a) 31 (b) 72 (c) 54 (d) 68

(a) 31^2 = L: 3^2 M: 3×1, 3×1 R: 1^2 = 9 3 1, 3 → **9 6 1**

31^2 = 961

(b) $72^2 = 7^2 \mid 7 \times 2 \mid 2^2$ = 49 | 14 | 4, 14 → 51 8 4

72^2 = 5184

(c) 54^2 = 25 | 20 | 16, 20 → 29 1 6 = 54^2 = 2916

(d) 68^2 = 36 | 48 | 64, 48 → 46 2 4 = 68^2 = 4624

Second Method
Yavadunam tavadunikritya vargam cha yojayet
(whatever is deviation add deviation and use square of deviation)

(a) 94^2 (b) 103^2 (c) 987^2 (d) 10016^2

(a) $94^2 = (94-06) \mid (-06)^2 = 88\ 36$
$94^2 = 88\ 36$

(b) $103^2 = (103 + 03) \mid (03)^2 = 106\ 09$
(c) $987^2 = (987 - 013) \mid (013)^2 = 974\ 169$
(d) $10016^2 = (10016 + 0016) \mid (0016)^2 = 10032\ 0256$

Third Method (First Method + Second Method)
Anurupyena (By ratio or propotionately) +

Yavadunam tavadunikritya vargam cha yojayet
(whatever is deviation add deviation and use square of deviation)

(a) $\mathbf{207^2}$ **(b)** $\mathbf{71^2}$ **(c)** $\mathbf{3988^2}$ **(d)** $\mathbf{5024^2}$ **(e)** $\mathbf{2004^2}$

$207^2 = 2\ (207+07) \mid (07)^2 = 428\ 49$

So, $\mathbf{207^2}$ **= 428 49**

(b) $71^2 = 7\ (71+1) \mid (1)^2 = 504\ 1$
(c) $3988^2 = 4\ (3988-012) \mid (-012)^2 = 15904\ 144$
(d) $5024^2 = 5\ (5024+024) \mid (024)^2 = 25240\ 576$
(e) $20004^2 = 2\ (20004+0004) \mid (0004)^2 = 40016\ 0016$

Fourth Method
Ekadhikena Purvena (One more than previous one)
(a) 35^2 (b) 95^2 (c) 395^2 (d) 5005^2 (e) 65^2
(a) $35^2 = (3 \times 4) \mid (5 \times 5) = 12\ 25.$
$35^2 = 12\ 25$

(b) $95^2 = (9 \times 10) \mid (5 \times 5) = 90\ 25$

(c) $395^2 = (39 \times 40) \mid (5 \times 5) = 1560\ 25$

(d) $5005^2 = (500 \times 501) \mid (5 \times 5) = 250500\ 25$

(e) $65^2 = (6 \times 7) \mid (5 \times 5) = 42\ 25$

Fifth Method

Ekanyunena Purvena (One less than previous one)

(a) 9999^2 (b) 99^2 (c) 999999999^2

(a) $9999^2 = (9999-1) \mid (9999-9998) = 99980001$

$9999^2 = 99980001$

(b) $99^2 = 9801$

(c) $999999999^2 = 999999998\ \ 000000001$

Sixth Method (Fourth + Fifth Method)

Ekadhikena Purvena (One more than previous one) +
Ekanyunena Purvena (One less than previous one)

(a) 1111 (b) 111111 (c) 11111111111

(a) $1111^2 = 1234 \mid 321 = 1234321$

So $1111^2 = 1234321$

(b) $111111^2 = 12345654321$

(c) $11111111111^2 = 123456789\ 0\ 1\ 0987654321$

$1\ 1\ 1$

$= 1234567890\ 1\ 2\ 0987654321$

Seventh Method

Sankalanvyavakalanabhyam (By addition and subtraction)

(a) 74 and 76 (b) 394 and 396 (c) 69 and 71

(a) $75^2 = 5625$ (Ekadhikena Purvena)

$74^2 = 5625-75-74 = 5476$

$76^2 = 5625+75+76 = 5776$

(b) $395^2 = 1560\ 25$ (By third method)

$394^2 = 156025 - 395 - 394 = 155236$

$396^2 = 156025 + 395 + 396 = 156816$

(c) $70^2 = 4900$ (by first method)

$69^2 = 900 - 70 - 69 = 4761$

$71^2 = 4900 + 70 + 71 = 5041$