Exercise 3.3

Q1 Find the squares of the following numbers using column method. verify the result by finding the squares using usual multiplication.

(i) 25 (ii) 37 (iii) 54 (iv) 71

(v) 96

Solution: (i) 25

here $a=2$, $b=5$

Column 1 a^2	Column 2 $2\times a\times b$	Column 3 b^2
4 + 2 6	20 + 2 22	25
6	2	5

$\therefore 25^2 = 625$

By usual Multiplication $25^2 = 25\times 25$

$= 625$

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(i) 37

S No	Column I a^2	Column II $2 \times a \times b$	Column III b^2	
(ii) $a=3$ $b=7$	9 $+4$ 13	$2 \times 3 \times 7 = 42$ $+4$ 46	49	
	13	6	9	$\therefore (37)^2 = 1369$
(iii) $a=5$ $b=4$	25 $+4$ 29	$2 \times 5 \times 4 = 40$ $+1$ 41	16	
	29	1	6	$(54)^2 = 2916$
(iv) $a=7$ $b=1$	49 $+1$ 50	$2 \times 7 \times 1 = 14$	1	
	50	4	1	$(71)^2 = 5041$
(v) $a=9$ $b=6$	81 $+11$ 92	$2 \times 9 \times 6 = 108$ $+3$ 111	36	
	92	1	6	$(96)^2 = 9216$

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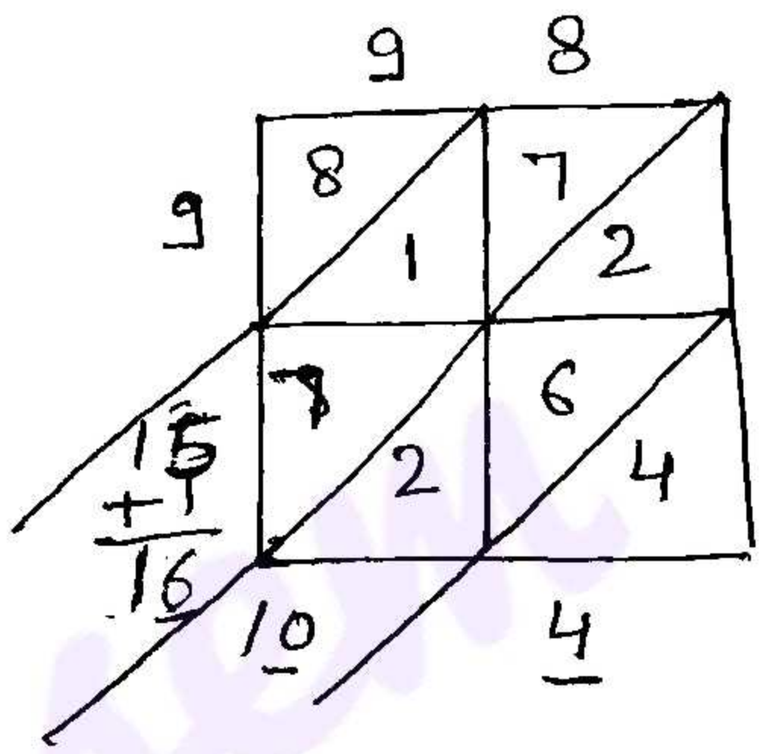
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Q.2 Find the squares of the following numbers using diagonal method.

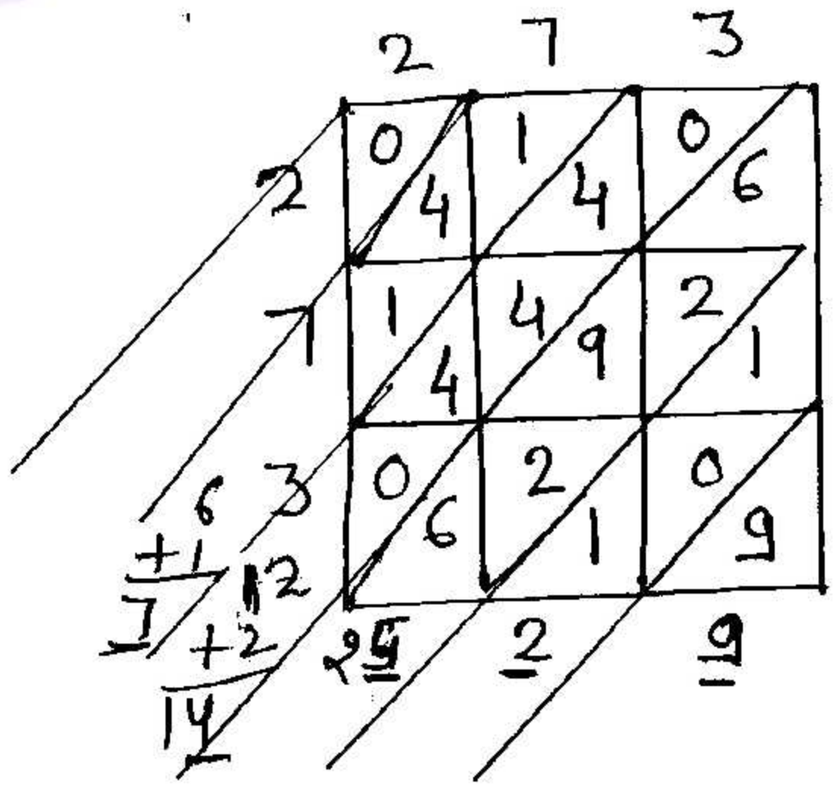
(i) 98^2 (ii) 273^2 (iii) 348

(iv) 295 (v) 171

Solution: (i) $98^2 = 9604$



(ii) $273^2 = 74529$

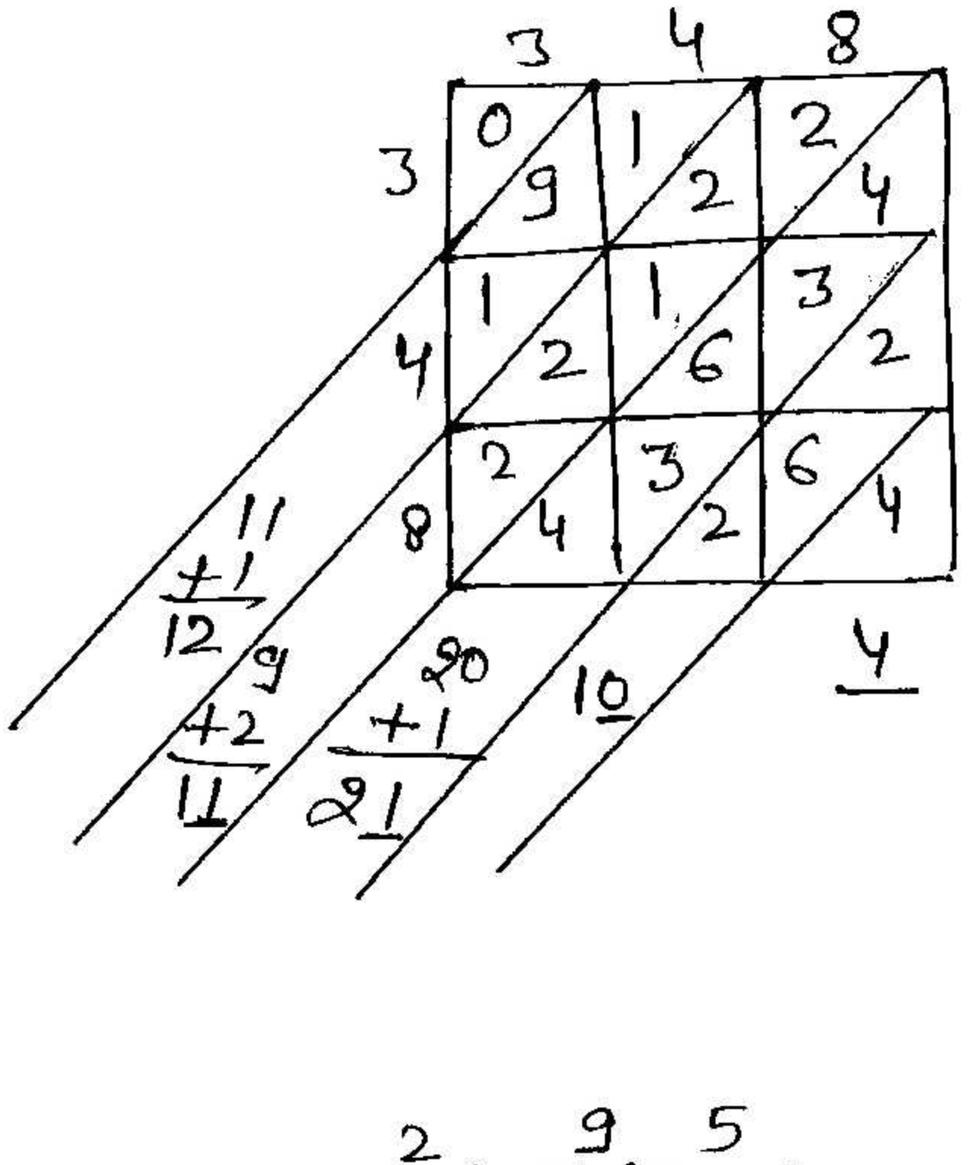


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(iii)

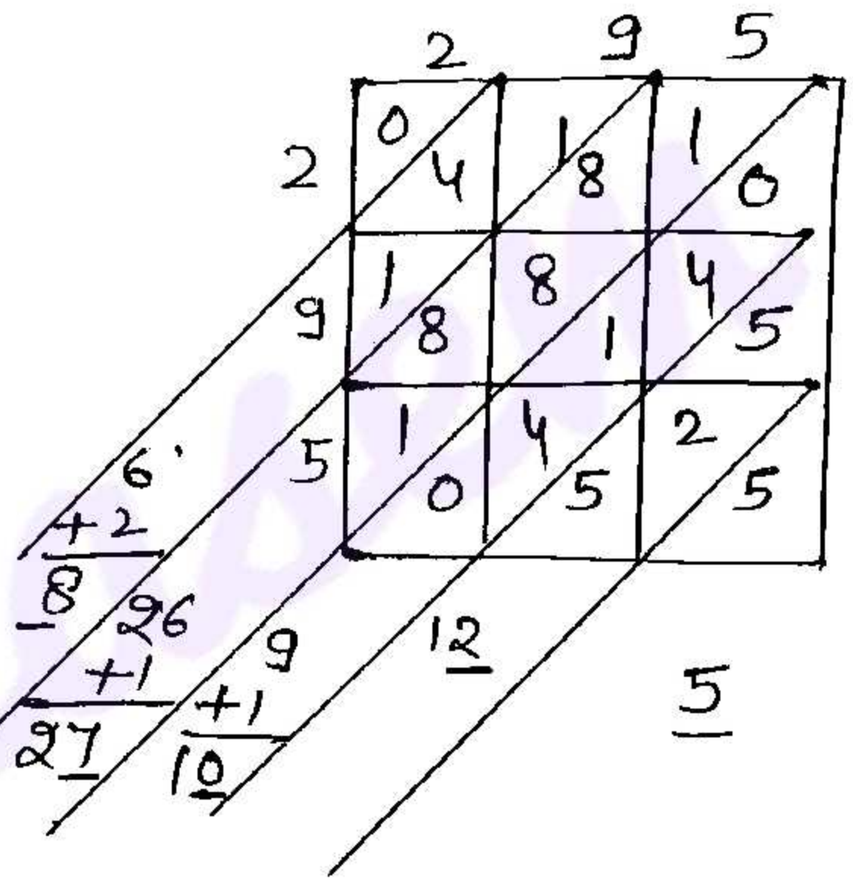
348

$\therefore 348^2 = 121104$



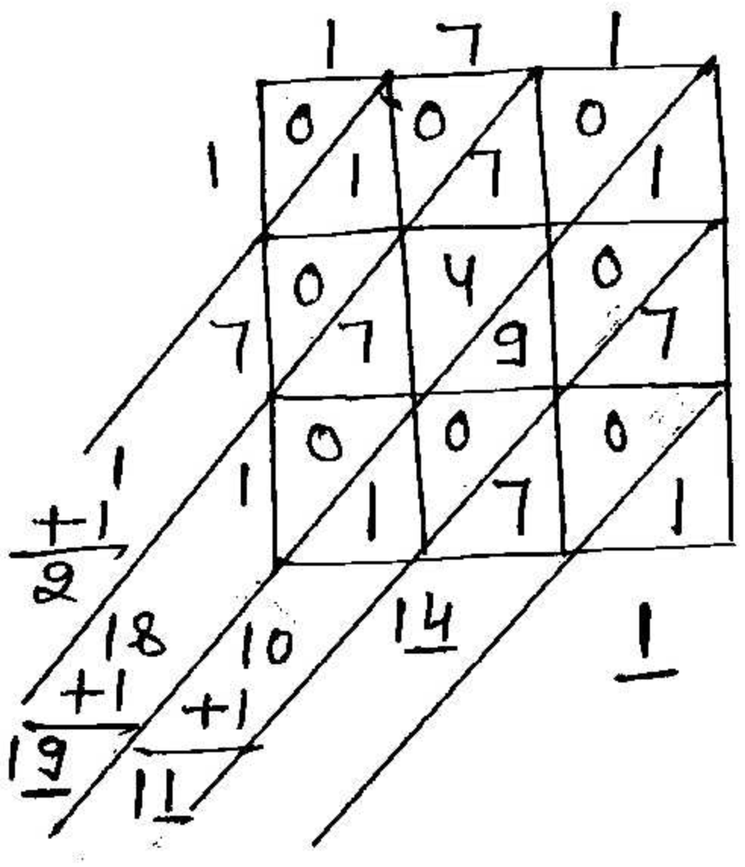
(iv) 295

$\therefore 295^2 = 87025$



(v) 171

$\therefore 171^2 = 29141$



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Q3 Find the squares of the following numbers.

(i) 127 (ii) 503 (iii) 451 (iv) 862

(v) 265

Solution (i) $127^2 = 127 \times 127 = 16129$

(ii) $503^2 = 503 \times 503 = 253009$

(iii) $451^2 = 451 \times 451 = 203401$

(iv) $862^2 = 862 \times 862 = 743044$

(v) $265^2 = 265 \times 265 = 70225$

Q.4 Find the square of the following numbers.

(i) 425 (ii) 575 (iii) 405 (iv) 205

(v) 95 (vi) 745 (vii) 512 (viii) 995

Sol: (i) $425^2 = 425 \times 425 = 180625$

(ii) $575^2 = 575 \times 575 = 330625$

(iii) $405^2 = 405 \times 405 = 164025$

(iv) $205^2 = 205 \times 205 = 42025$

(v) $95^2 = 95 \times 95 = 9025$

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(vi) $745^2 = 745 \times 745 = 555025$

(vii) $512^2 = 512 \times 512 = 262144$

(viii) $995^2 = 995 \times 995 = 990025$

Q.5 Find the squares of the following numbers using the identity $(a+b)^2 = a^2 + 2ab + b^2$

(i) 405 (ii) 510 (iii) 1001 (iv) 209

(v) 605

Solution (i) $405^2 = (400+5)^2$

here $a = 400$, $b = 5$

$= (400)^2 + 2 \times 400 \times 5 + (5)^2$

$= 160000 + 4000 + 25$

$= 164025$

(ii) $510^2 = (500 + 10)^2$

$= (500)^2 + 2 \times 500 \times 10 + (10)^2$

$= 250000 + 10000 + 100$

$= 260100$

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(iii) $1001^2 = (1000+1)^2$

$= (1000)^2 + 2\times1000\times1 + (1)^2$

$= 1000000 + 2000 + 1 = 1002001$

(iv) $209^2 = (200+9)^2$

$= (200)^2 + 2\times200\times9 + (9)^2$

$= 40000 + 3600 + 81$

$= 43681$

(v) $(605)^2 = (600+5)^2$

$= (600)^2 + 2\times600\times5 + (5)^2$

$= 360000 + 6000 + 25 = 366025$

Q6 Find the squares of the following numbers using identity $(a-b)^2 = a^2 - 2ab + b^2$

(i) 395 (ii) 995 (iii) 495 (iv) 498

(v) 99 (vi) 999 (vii) 599

Sol: (i) $395^2 = (400-5)^2$

{ $(a-b)^2 = a^2 - 2ab + b^2$

$= (400)^2 - 2\times400\times5 + (5)^2$

$= 160000 - 4000 + 25 = 156025$

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(ii) $995^2 = (1000-5)^2$

$= (1000)^2 - 2\times1000\times5 + (5)^2$

$= 1000000 - 10000 + 25 = 990025$

(iii) $495^2 = (500-5)^2$

$= (500)^2 - 2\times500\times5 + (5)^2$

$= 250000 - 5000 + 25 = 245025$

(iv) $498^2 = (500-2)^2$

$= (500)^2 - 2\times500\times2 + (2)^2$

$= 250000 - 2000 + 4 = 248004$

(v) $99^2 = (100-1)^2$

$= (100)^2 - 2\times100\times1 + (1)^2$

$= 10000 - 200 + 1 = 9801$

(vi) $999^2 = (1000-1)^2$

$= (1000)^2 - 2\times1000\times1 + (1)^2$

$= 1000000 - 2000 + 1 = 998001$

(vii) $599^2 = (600-1)^2$

$= (600)^2 - 2\times600\times1 + (1)^2$

$= 360000 - 1200 + 1 = 358801$

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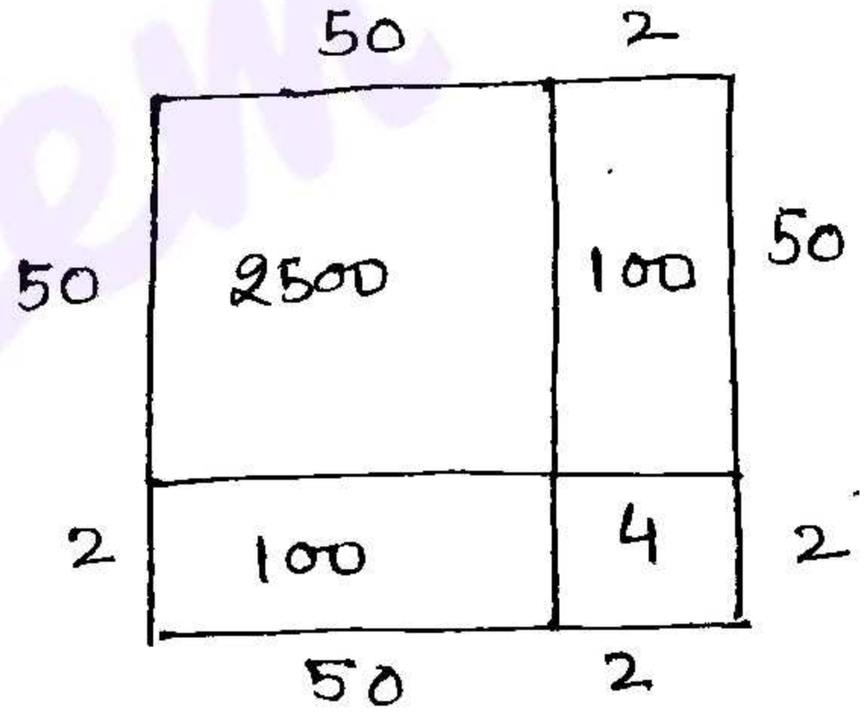
Q.7 Find the squares of the following by Visual Method.

(i) 52 (ii) 95 (iii) 505 (iv) 702

(v) 99

Sol: (i) 52^2

We have $52 = 50+2$, let us draw a square of side 52 units and divide it in parts as shown



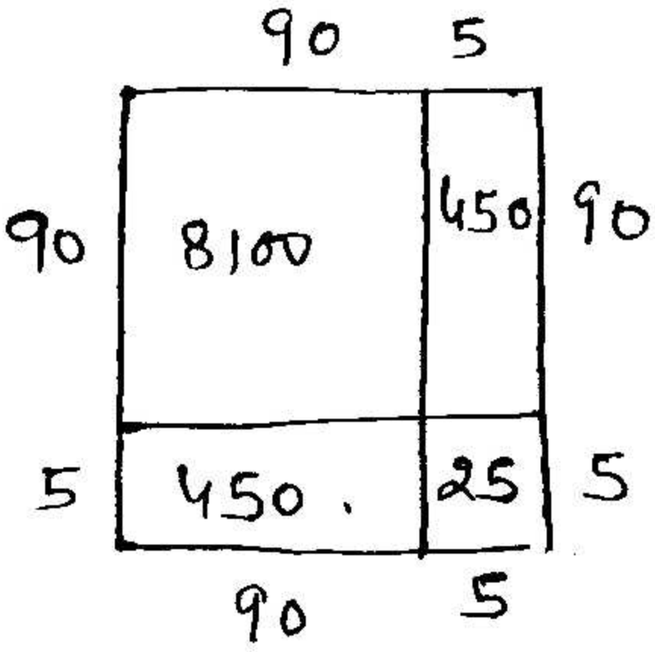
$\therefore$ Sum of areas

$= 2500 + 100 + 100 + 4$

$= 2704$

$\therefore 52^2 = 2704$

(ii) $95^2 = (90+5)^2$



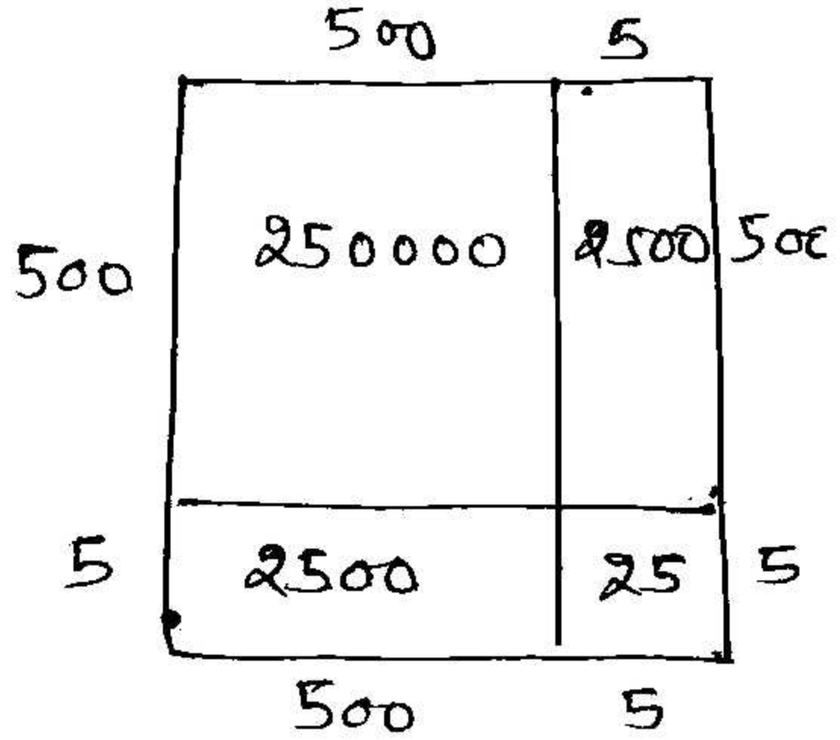
Sum of areas

$= 8100 + 450 + 450 + 25$

$95^2 = 9025$

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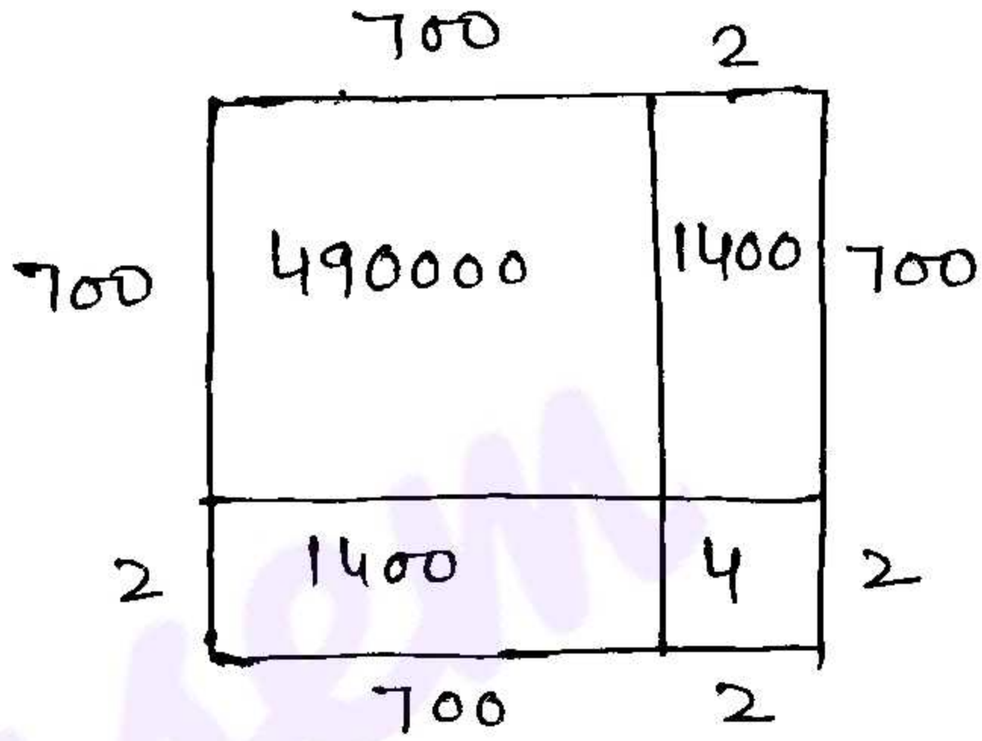
(iii) $505^2 = (500+5)^2$



$505^2 = 250000 + 2500 + 2500 + 25$

$= 255025$

(iv) $702^2 = (700+2)^2$

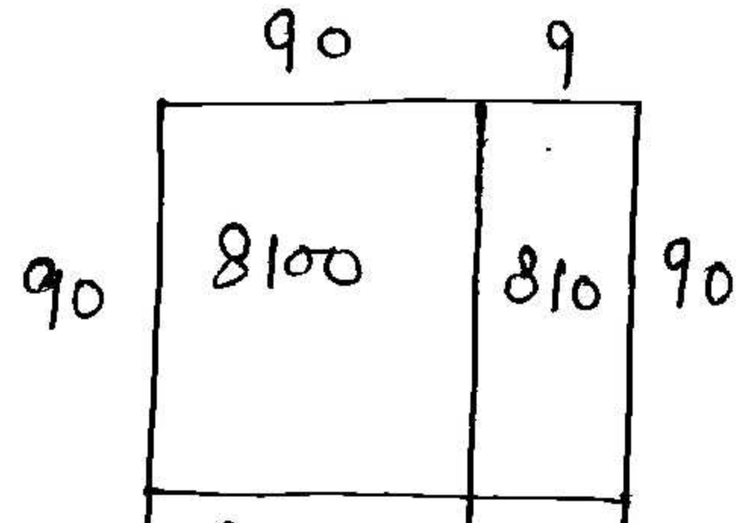


Sum of areas

$= 490000 + 1400 + 1400 + 4$

$= 492804$

(v) $99^2 = (90+9)^2$



Sum of areas

$= 8100 + 810 + 810 + 81$

$= 9801$

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