

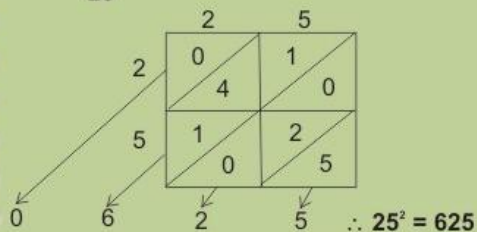
### Perfect Square

A natural no. is perfect sq. if it is sq. of some natural no.  
e.g. 36 is perfect sq because it is the sq. of 6

### Properties of perfect square

1. No. ending with 2,3,7,8 never be a perfect square
2. No. ending with odd no of zero never be a perfect sq.
3. Diff of square of two consecutive natural no. is equal to their sum.  $(n+1)^2 - n^2 = (n+1) + (n)$
4. Pythagorean triplet (x,y,z) if  $z^2 = x^2 + y^2$

Ex. Square by diagonal method.  
 $25^2$



### Square by column method

Ex. To find  $25^2$ , take  $a = 2$ ,  $b = 5$

$a^2$	$2ab$	$b^2$
$2^2$	$2 \times 2 \times 5$	$5^2$
4	20	25
+2	+2	
6	22	

$$25^2 = 625$$

### Square Root

Square root of no x, in that no whose square is x.  
Ex. Sq. root of 64 is 8 because  $8^2 = 64 \Rightarrow \sqrt{64} = 8$ .

### Prime factorization

Q. Find sq. root of 36.

Sol.  $\sqrt{36} = \sqrt{2 \times 2 \times 3 \times 3}$   
 $= 2 \times 3 = 6$

2	36
2	18
3	9
3	3
	1

### Long Division method.

Q. Find sq. root 58081.

241	
2	58081
2	4
44	180
+4	176
481	481
	481
	x
	$\sqrt{58081} = 241$

## Square and Square Roots

When a number is multiplied with it self  
e.g. Square of 7 is  $7 \times 7 = 49$ .

Chart

### Square root of fraction

$$\sqrt{a \times b} = \sqrt{a} \times \sqrt{b}$$

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$$

Ex.  $\sqrt{\frac{529}{841}} = \frac{\sqrt{529}}{\sqrt{841}} = \frac{23}{29}$

Ex.  $\sqrt{36 \times 49} = \sqrt{36} \times \sqrt{49} = 6 \times 7 = 42$

### Successive subtraction

We successive subtract odd no from the given no. till we get zero. The number of time we subtract is the square root of the no.

Ex.  $\sqrt{16}$

$$16 - 1 = 15$$

$$15 - 3 = 12$$

$$12 - 5 = 7$$

$$7 - 7 = 0 \text{ so } \sqrt{16} = 4$$