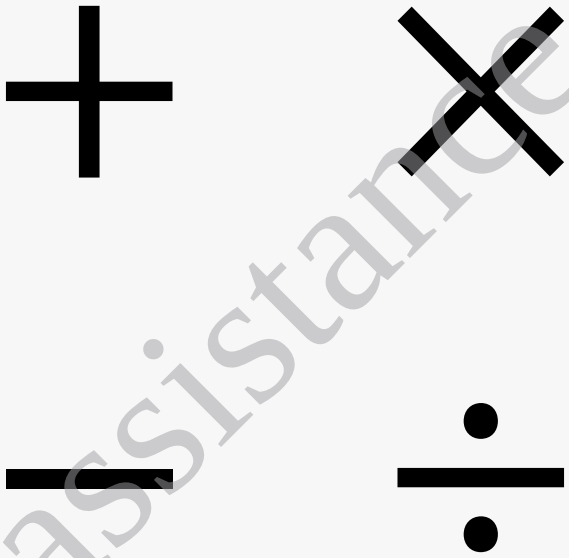
Square And Square Roots
Ex. 5.3



Exc 5.3

1. (A) 3 digits

$\sqrt{12321}$ – 3 digits

2.

$$\begin{array}{r|l} & 2.1 \\ \hline 2 & 4.\overline{41} \\ +2 & -4 \\ \hline 41 & \ \ 41 \\ & -41 \\ \hline & \ \ \ 0 \end{array}$$

$\sqrt{4.41} = 2.1$ (B)

3.

$$\begin{array}{r|l} & 13 \\ \hline 1 & 1\overline{65} \\ +1 & -1 \\ \hline 23 & \ 65 \\ & -69 \\ \hline & \ \ \ 4 \end{array}$$

∴ Least number to be added = 4 (C)

4.

$$\begin{array}{r|l} & 27 \\ \hline 2 & 7\overline{43} \\ +2 & -4 \\ \hline 47 & 343 \\ & -329 \\ \hline & \ \ 14 \end{array}$$

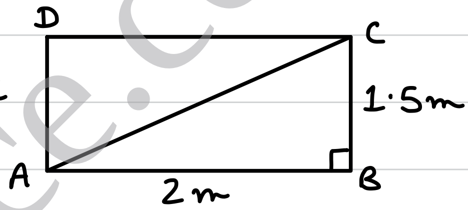
Least number to be subtracted = 14 (B)

5. Least number of four digits = 1000

	32
3	1000
+3	−9
62	100
	−124
	24

∴ Least number of four digits which is a perfect square = 1000 + 24 = 1024 (D)

6. Using Pythagoras theorem in $\triangle ABC$



$AC^2 = AB^2 + BC^2$

or $AC^2 = 2^2 + (1.5)^2$

or $AC^2 = 4 + 2.25$

or $AC^2 = 6.25$

or $AC = \sqrt{6.25}$

or $AC = 2.5$ (C)

	2.5
2	6.25
+2	−4
45	225
	−225
	0

7a. 9801

Since two pairs are formed.

∴ Number of digits in square root = 2

b. 625

Number of digits in square root = 2

c. 4356

Since two pairs are formed.

∴ Number of digits in square root = 2

d. 14641

Number of digits in square root = 3

8 a.

```
        19
   1 | 361
  +1 | -1
  ---+-----
  29 | 261
     |-261
  ---+-----
     |   0
```

$\sqrt{361} = 19$

b.

```
         52
   5 | 2704
  +5 | -25
  ---+------
 102 |  204
     | -204
  ---+------
     |    0
```

$\sqrt{2704} = 52$

c.

```
         82
   8 | 6724
  +8 | -64
  ---+------
 162 |  324
     | -324
  ---+------
     |    0
```

$\sqrt{6724} = 82$

d.

```
         151
    1 | 22801
   +1 | -1
   ---+-------
   25 | 128
   +5 | -125
   ---+-------
  301 |   301
      |  -301
   ---+-------
      |     0
```

$\sqrt{22801} = 151$

9a $\sqrt{\frac{49}{121}} = \frac{\sqrt{49}}{\sqrt{121}} = \frac{\sqrt{7\times7}}{\sqrt{11\times11}} = \frac{7}{11}$

b. $\sqrt{\frac{49}{196}} = \frac{\sqrt{49}}{\sqrt{196}} = \frac{\sqrt{7\times7}}{\sqrt{2\times2\times7\times7}} = \frac{7}{2\times7} = \frac{\cancel{7}1}{\cancel{14}2} = \frac{1}{2}$

2	196
2	98
7	49
	7

c. $\sqrt{66\frac{25}{36}} = \frac{\sqrt{2401}}{\sqrt{36}} = \frac{\sqrt{7\times7\times7\times7}}{\sqrt{2\times2\times3\times3}}$

$= \frac{7\times7}{2\times3}$

$= \frac{49}{6}$

$= 8\frac{1}{6}$

7	2401
7	343
7	49
	7

2	36
2	18
3	9
	3

d. $\sqrt{\frac{3481}{4489}}$

59	3481
	59

67	4489
	67

$= \frac{\sqrt{3481}}{\sqrt{4489}}$

$= \frac{\sqrt{59\times59}}{\sqrt{67\times67}}$

$= \frac{59}{67}$

10a

	2·6
2	6·76
+2	-4
46	276
	-276
	0

$\sqrt{6.76} = 2.6$

b.

	2.7
2	7.29
+2	−4
47	329
	−329
	0

$\sqrt{7.29} = 2.7$

c.

	0.25
2	0.0625
+2	−4
45	225
	−225
	0

$\sqrt{0.0625} = 0.25$

d.

	7.2
7	51.84
+7	−49
142	284
	−284
	0

$\sqrt{51.84} = 7.2$

11. Let the number be x

$x \times x = 5.0625$

or $x^2 = 5.0625$

or $x = \sqrt{5.0625}$

or $x = 2.25$

$\therefore$ Required number $= 2.25$

	2.25
2	5.0625
+2	−4
42	106
+2	−84
445	2225
	−2225
	0

12.a. $\sqrt{1296 \times 625}$

$= \sqrt{1296} \times \sqrt{625}$

$= 36 \times 25$

$= 900$

	36
3	1296
+3	−9
66	396
	−396
	0

	25
2	625
+2	−4
45	225
	−225
	0

b. $\sqrt{8.41 \times 32.49}$

$= \sqrt{8.41} \times \sqrt{32.49}$

$= 2.9 \times 5.7$

$= 16.53$

	2.9
2	8.41
+2	−4
49	441
	−441
	0

	5.7
5	32.49
+5	−25
107	749
	−749
	0

c. $\sqrt{\dfrac{3.61}{72.25}}$

$= \dfrac{\sqrt{3.61}}{\sqrt{72.25}}$

$= \dfrac{1.9}{8.5}$

$= \dfrac{19}{85}$

	1.9
1	3.61
+1	−1
29	261
	−261
	0

	8.5
8	72.25
+8	−64
165	825
	−825
	0

13. greatest number of four digits = 9999

	9
9	9999
+9	−81
189	1899
	−1701
	198

Required perfect square number

$= 9999 - 198$

$= 9801$

14. Let the side of square be x cm

Area of square $= 156.25\ cm^2$

or $x^2 = 156.25$

or $x = \sqrt{156.25}$

or $x = 12.5$

$\therefore$ Side of square $= 12.5$ cm

		12.5
	1	156.25
+1		-1
22		56
+2		-44
245		1225
		-1225
		0

15.

		22
	2	500
+2		-4
42		100
		-84
		16

$\therefore$ No. of children left out in the arrangement $= 16$