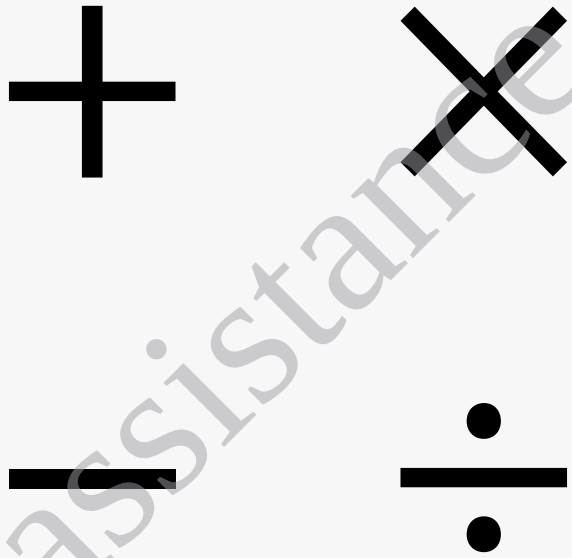
Square And Square Roots
Ex. 5.1



Ex. 5.1

1. $(2.2)^2 = 2.2 \times 2.2 = 4.84$ (C)

2. $\left(\frac{3}{7}\right)^2 = \frac{3}{7} \times \frac{3}{7} = \frac{9}{49}$ (D)

3. $(85)^2 = 85 \times 85 = 7225$ (B)

4. $(755)^2 - (745)^2$

$= 755 + 745$ $[\because (n+1)^2 - n^2 = n+1+n = 2n+1]$

$= 1500$ (B)

5. 25000 (B)

25000 is not a perfect square as there are odd number of zeros.

6 a. The unit's digit of the square of 37 is 9 as $7^2 = 49$.

b. The unit's digit of the square of 123 is 9 as $3^2 = 9$.

c. The unit's digit of the square of 495 is 5 as $5^2 = 25$.

d. The unit's digit of the square of 334 is 6 as $4^2 = 16$.

e. The unit's digit of the square of 62 is 4 as $2^2 = 4$.

f. The unit's digit of the square of 190 is 0 as $0^2 = 0$.

g. The unit's digit of the square of 199 is 1 as $9^2 = 81$.

h. The unit's digit of the square of 231 is 1 as $1^2 = 1$.

7 a. Square of 136 is an even number as it is an even number.

b. Square of 231 is an odd number as it is an odd number.

c. Square of 179 is an odd number as it is an odd number.

d. Square of 100 is an even number as it is an even number.

e. Square of 1009 is an odd number as it is an odd number.

f. Square of 3254 is an even number as it is an even number.

g. Square of 563 is an odd number as it is an odd number.

8a. $81 = 1+3+5+7+9+11+13+15+17$

b. $169 = 1+3+5+7+9+11+13+15+17+19+21+23+25$

9a

$$\begin{array}{r|l} 2 & 450 \\ \hline 3 & 225 \\ \hline 3 & 75 \\ \hline 5 & 25 \\ \hline & 5 \end{array}$$

$450 = 2 \times \underline{3 \times 3} \times \underline{5 \times 5}$

Since 2 does not occur in a pair

$\therefore$ 450 must be multiplied by 2 to get a perfect square.

$\therefore$ Required least number $= 2$

b.

$$\begin{array}{r|l} 2 & 600 \\ \hline 2 & 300 \\ \hline 2 & 150 \\ \hline 3 & 75 \\ \hline 5 & 25 \\ \hline & 5 \end{array}$$

$600 = \underline{2\times2}\times2\times3\times\underline{5\times5}$

Since 2 and 3 do not occur in a pair.

∴ We multiply 600 by $2\times3=6$ to get a perfect square.

∴ Required least number = 6

c.

7	343
7	49
	7

$343 = \underline{7\times7}\times7$

Since 7 does not occur in a pair

∴ We multiply 343 by 7 to get a perfect square.

∴ Required least number = 7

d.

2	3456
2	1728
2	864
2	432
2	216
2	108
2	54
3	27
3	9
	3

$3456 = \underline{2\times2}\times\underline{2\times2}\times\underline{2\times2}\times2\times\underline{3\times3}\times3$

2 and 3 do not occur in a pair.

∴ We multiply 3456 by $2\times3=6$ to get a perfect square.

∴ Required least number = 6

10a.

2	512
2	256
2	128
2	64
2	32
2	16
2	8
2	4
	2

$512 = 2\times2\times2\times2\times2\times2\times2\times2\times2$

Since 2 does not occur in a pair.

∴ We divide 512 by 2 to get a perfect square.

∴ Required least number = 2

b.

2	1000
2	500
2	250
5	125
5	25
	5

$1000 = 2\times2\times2\times5\times5\times5$

Since 2 and 5 do not occur in a pair.

∴ We divide 1000 by $2\times5=10$ to get a perfect square.

∴ Required least number = 10

c.

2	6272
2	3136
	1568

	2 | 1568 2 | 784 2 | 392 2 | 196 2 | 98 7 | 49 7
	$6272 = \underline{2\times2}\times\underline{2\times2}\times\underline{2\times2}\times2\times\underline{7\times7}$
	Since 2 does not occur in a pair.
	$\therefore$ We divide 6272 by 2 to get a perfect square.
	$\therefore$ Required least number = 2
d.	2 | 10224 2 | 5112 2 | 2556 2 | 1278 3 | 639 3 | 213 71
	Since 71 does not occur in a pair.
	$\therefore$ We divide 10224 by 71 to get a perfect square.
	$\therefore$ Required least number = 71
11a.	$15 = 2\times7+1$
	$\therefore 15 = 8^2 - 7^2$
b.	$117 = 2\times58+1$
	$\therefore 117 = 59^2 - 58^2$
c.	$231 = 2\times115+1$
	$\therefore 231 = 116^2 - 115^2$

12. $11^2 = 121$

$101^2 = 10201$

$10101^2 = 102030201$

$1010101^2 = 10203040302010$

13a. $1 + 3 + 5 + 7 + 9 = 5^2 = 25$

b. $1 + 3 + 5 + 7 + 9 + 11 + 13 = 7^2 = 49$

c. $1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 = 10^2 = 100$

14.a. $7^2 = 1 + 3 + 5 + 7 + 9 + 11 + 13$

b. $9^2 = 1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17$

c. $13^2 = 1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21 + 23 + 25$

15.a. $\left(-\frac{4}{9}\right)^2 = \left(-\frac{4}{9}\right) \times \left(-\frac{4}{9}\right) = \frac{16}{81}$

b. $\left(\frac{3}{11}\right)^2 = \frac{3}{11} \times \frac{3}{11} = \frac{9}{121}$

c. $\left(\frac{9}{17}\right)^2 = \frac{9}{17} \times \frac{9}{17} = \frac{81}{289}$

d. $\left(\frac{13}{19}\right)^2 = \frac{13}{19} \times \frac{13}{19} = \frac{169}{361}$

e. $\left(-\frac{5}{13}\right)^2 = \left(\frac{-5}{13}\right) \times \left(\frac{-5}{13}\right) = \frac{25}{169}$

f. $\left(\frac{19}{23}\right)^2 = \frac{19}{23} \times \frac{19}{23} = \frac{361}{529}$

16. $1^2 + 2^2 + 2^2 = 3^2$

$2^2 + 3^2 + 6^2 = 7^2$

$3^2 + 4^2 + \underline{12^2} = 13^2$ (a)

$4^2 + \underline{5^2} + 20^2 = 21^2$ (b)

(c) $6^2 + \underline{7^2} + 42^2 = \underline{43^2}$ (d)

(e) $\underline{8^2} + 9^2 + 72^2 = 73^2$