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16/4/2020

Square And Square roots, cube and cube roots

Exercise 3-A

Ques-1 Find the square of each of the following numbers:-

i) 14

$14^2 = 14 \times 14$

$= 196$

ii) 137

$137^2 = 137 \times 137$

$= 18769$

iii) $\frac{4}{17}$

$\left[\frac{4}{17}\right]^2 = \frac{4 \times 4}{17 \times 17} = \frac{16}{289}$

iv) $2\frac{3}{4}$

$\frac{2 \times 4 + 3}{4} = \frac{8+3}{4} = \frac{11}{4}$

$\left[\frac{11}{4}\right]^2 = \frac{11 \times 11}{4 \times 4} = \frac{121}{16} = 7\frac{9}{16}$

v) 0·01

$0·01 = \frac{1}{100}$

$\left[\frac{1}{100}\right]^2 = \frac{1\times1}{100\times100} = \frac{1}{10000} = 0·0001$

vi) 1·2

$1·2 = \frac{12}{10}$

$\left[\frac{12}{10}\right]^2 = \frac{12\times12}{10\times10} = \frac{144}{100} = 1·44$

vii) 0·17

~~0·17~~ $0·17 = \frac{17}{100}$

$\left[\frac{17}{100}\right]^2 = \frac{17\times17}{100\times100} = \frac{289}{10000} = 0·0289$

viii) 4·6

$4·6 = \frac{46}{10}$

$\left[\frac{46}{10}\right]^2 = \frac{46\times46}{10\times10} = \frac{2116}{100} = 21·16$

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Ques-2 using Prime factorization method, find which of the following are perfect square numbers :-

i) 252

2 | 252
2 | 126
3 | 63
3 | 21
7 | 7
1

$252 = \overline{2 \times 2} \times \overline{3 \times 3} \times 7$

∴ 252 is not a perfect square

ii) 324

2 | 324
2 | 162
3 | 81
3 | 27
3 | 9
3 | 3
1

$324 = \overline{2 \times 2} \times \overline{3 \times 3} \times \overline{3 \times 3}$

∴ 324 is a perfect square number.

iii) 676

2 | 676
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2	676
2	338
13	169
13	13
	1

$676 = \overline{2 \times 2} \times \overline{13 \times 13}$

$\therefore$ 676 is a perfect square number.

iv.) 1225

5	1225
5	245
7	49
7	7
	1

$1225 = \overline{5 \times 5} \times \overline{7 \times 7}$

$\therefore$ 1225 is a perfect square number.

v.) 2916

2	2916
2	1458
3	729
3	243
3	81
3	27
3	9
3	3
	1

$2916 = \overline{2 \times 2} \times \overline{3 \times 3} \times \overline{3 \times 3} \times \overline{3 \times 3}$

$\therefore$ 2916 is a perfect square number.

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vi) 3528

2	3528
2	1764
2	882
3	441
3	147
7	49
7	7
	1

$3528 = \overline{2 \times 2} \times \overline{3 \times 3} \times \overline{7 \times 7}$

∴ 3528 is a perfect square number.

vii) 5625

3	5625
3	1875
5	625
5	125
5	25
5	5
	1

$5625 = \overline{3 \times 3} \times \overline{5 \times 5} \times \overline{5 \times 5}$

∴ 5625 is a perfect square number

viii) 9075

3	9075
5	3025
5	605
11	121
11	11

$9075 = 3 \times \overline{5 \times 5} \times \overline{11 \times 11}$

$\therefore$ 9075 is a perfect square number.

Ques 3 Show that each of the following numbers is a perfect square. Also, find the square root of each :-

i) 441

3	441
3	147
7	49
7	7
	1

$441 = \overline{3 \times 3} \times \overline{7 \times 7}$

$\therefore$ 441 is a perfect square number

$441 = 3 \times 3 \times 7 \times 7$

$\sqrt{441} = 3 \times 7 = 21$

ii) 784

2	784
2	392
2	196
2	98
7	49
7	7
	1

$784 = \overline{2 \times 2} \times \overline{2 \times 2} \times \overline{7 \times 7}$

$\therefore$ 784 is a perfect square number.

$9075 = 3 \times \overline{5 \times 5} \times \overline{11 \times 11}$

$\therefore$ 9075 is a perfect square number.

Ques 3 Show that each of the following numbers is a perfect square. Also, find the square root of each:-

i) 441

3	441
3	147
7	49
7	7
	1

$441 = \overline{3 \times 3} \times \overline{7 \times 7}$

$\therefore$ 441 is a perfect square number.

$441 = 3 \times 3 \times 7 \times 7$

$\sqrt{441} = 3 \times 7 = 21$

ii) 784

2	784
2	392
2	196
2	98
7	49
7	7
	1

$784 = \overline{2 \times 2} \times \overline{2 \times 2} \times \overline{7 \times 7}$

$\therefore$ 784 is a perfect square number.

$784 = 2 \times 2 \times 2 \times 2 \times 7 \times 7$

$\sqrt{784} = 2 \times 2 \times 7 = 4 \times 7 = 28$

(iii) 1225

5	1225
5	245
7	49
7	7
	1

$1225 = \overline{5 \times 5} \times \overline{7 \times 7}$

$\therefore$ 1225 is a perfect square number

$1225 = 5 \times 5 \times 7 \times 7$

$\sqrt{1225} = 5 \times 7 = 35$

(iv) 3969

3	3969
3	1323
3	441
3	147
7	49
7	7
	1

$3969 = \overline{3 \times 3} \times \overline{3 \times 3} \times \overline{7 \times 7}$

$\therefore$ 3969 is a perfect square number

$3969 = 3 \times 3 \times 3 \times 3 \times 7 \times 7$

$\sqrt{3969} = 3 \times 3 \times 7 = 9 \times 7 = 63$

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v.) 2601

3	2601
3	867
17	289
17	17
	1

$2601 = \overline{3 \times 3} \times \overline{17 \times 17}$

∴ 2601 is a perfect square number

$2601 = 3 \times 3 \times 17 \times 17$

$\sqrt{2601} = 3 \times 17 = 51$

vi.) 5929

11	5929
11	539
7	49
7	7
	1

$5929 = \overline{11 \times 11} \times \overline{7 \times 7}$

∴ 5929 is a perfect square number

$5929 = \overline{11 \times 11} \times \overline{7 \times 7}$

$\sqrt{5929} = 11 \times 7 = 77$

vii.) 7056

→

2	7056
2	3528
2	1764
2	882
3	441
3	147
7	49
7	7
	1

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$7056 = \overline{2\times2}\times\overline{2\times2}\times\overline{3\times3}\times\overline{3\times3}\times\overline{7\times7}$

$\therefore$ 7056 is a perfect square number

$7056 = 2\times2\times2\times2\times3\times3\times3\times3\times7\times7$

~~$\sqrt{7056} = 2\times2\times3\times3\times7 = 4\times3\times3\times7 = 12\times3\times7$~~

~~$= 36\times7 =$~~

$\sqrt{7056} = 2\times2\times3\times3\times7 = 252$

viii.) 8281

7	8281
7	1183
13	169
13	13
	1

$8281 = \overline{7\times7}\times\overline{13\times13}$

$\therefore$ 8281 is a perfect square number

$8281 = 7\times7\times13\times13$

$\sqrt{8281} = 7\times13 = 91$

Ques 4 Find the smallest number by which each of the following numbers must be multiplied to get a perfect square number. Also, find the square root of the resulting number.

i) 588

2	588
2	294
3	147
7	49
7	7
	1

$588 = \overline{2\times2}\times(3)\times\overline{7\times7}$

So we multiply by 3

Perfect square number = 7056

= 1764

= $\sqrt{2 \times 2} \times \sqrt{3 \times 3} \times \sqrt{7 \times 7}$

$\sqrt{1764}$ = 2 × 3 × 7

= 42

ii) 2592

2	2592
2	1296
2	648
2	324
2	162
3	81
3	27
3	9
3	3
	1

$\sqrt{2592} = \sqrt{2 \times 2} \times \sqrt{2 \times 2} \times \sqrt{2 \times 2} \times \sqrt{3 \times 3} \times \sqrt{3 \times 3}$

So, we multiply by 2

Perfect square number = 2592 × 2 = 5184

$\sqrt{5184} = 2 \times 2 \times 2 \times 3 \times 3$

= 72

iii) 3332 →

2	3332
2	1666
7	833
17	119
17	17
	1

$3332 = \sqrt{2 \times 2} \times \sqrt{7} \times \sqrt{17 \times 17}$

So, we multiply by 17

Perfect square number = 3332 × 17

= 56644

$= \sqrt{2 \times 2} \times \sqrt{17 \times 17} \times \sqrt{7 \times 7}$

$\sqrt{56644} = 2 \times 7 \times 17 = 238$

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iv) 3380

$3380 = \overline{2\times2} \times 5 \times \overline{13\times13}$

So, we multiply by 5

Perfect square number = 3380 × 5

= 16900

$= \overline{2\times2} \times \overline{5\times5} \times \overline{13\times13}$

$\sqrt{16900} = 2\times5\times13 = 130$

2	3380
2	1690
5	845
13	169
13	13
	1

Ques-5 By which least number should the given number be divided to obtain a perfect square number? Also, find the resulting perfect square number and its square roots.

i) 1728 →

$1728 = \overline{2\times2} \times \overline{2\times2} \times \overline{2\times2} \times 3\times3\times 3$

So, we divide by 3

Perfect square number = 1728 ÷ 3

= 576

$576 = \overline{2\times2} \times \overline{2\times2} \times \overline{2\times2} \times \overline{3\times3} \times \overline{3\times3}$

$\sqrt{576} = 2\times2\times2\times3$

$= 24$

2	1728
2	864
2	432
2	216
2	108
2	54
3	27
3	9
3	3
	1

ii) 4500 →

$4500 = \overline{2\times2} \times \overline{3\times3} \times \overline{5\times5} \times 5$

So, we divided by 5

2	4500
2	2250
3	1125
3	375
5	125
5	25
5	5
	1

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Perfect square number = 1500 ÷ 3
= 500

$500 = \overline{2\times2} \times 5 \times \overline{5\times5}$

$\sqrt{500} = 2\times5\times5 = 50$

ii) 7776 ⟶

2	7776
2	3888
2	1944
2	972
2	486
3	243
3	81
3	27
3	9
3	3
	1

$7776 = \overline{2\times2}\times\overline{2\times2}\times\overline{3\times3}\times\overline{3\times3}$
$= 2\times3 = 6$

So, we divided by 6

Perfect square number = 7776 ÷ 6
= 1269

$1269 = \overline{3\times3}\times\overline{3\times3}\times\overline{2\times2}$

$\sqrt{1269} = 3\times3\times2\times2 = 36$

iv) 8820

2	8820
2	4410
3	2205
3	735
5	245
7	49
7	7
	1

$8820 = \overline{2\times2}\times\overline{3\times3}\times5\times\overline{7\times7}$

So, we divided it by 5

Perfect square number = 8820 ÷ 5
= 1764

$1764 = \overline{2\times2}\times\overline{3\times3}\times\overline{7\times7}$

$\sqrt{1764} = 2\times3\times7 = 42$

Ques-6 The students of a class arranged a picnic. Each student contributed as many rupees as the

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number of students in the class. If the total Contribution is ₹1156, find the strength of the class?

Let no of students be x
Rs given by each student be x

Total amount $= x \times x$
$= x^2$

2	1156
2	578
17	289
17	17
	1

According to Question

$x^2 = 1156$
$x = \sqrt{1156}$
$x = \sqrt{2 \times 2 \times 17 \times 17}$
$= 2 \times 17 = 34$

Ques-7 In an auditorium, the number of rows is equal to the number of chairs in each row. If the Capacity of the auditorium is 2025, find the number of chairs in each row?

Let no of rows be x
Number of chairs in each row be x

Total Capacity $= x \times x$
$= x^2$

3	2025
3	675
3	225
3	75
5	25
5	5
	1

According to Question

$x^2 = 2025$
$x = \sqrt{2025}$
$x = \sqrt{3 \times 3 \times 3 \times 3 \times 5 \times 5}$
$x = 3 \times 3 \times 5 = 45$

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Q-8 Find the least square number which is exactly divisible by each of the numbers 8, 9, 10 and 15.

2 | 8, 9, 10, 15	2 | 240
2 | 4, 9, 5, 15	2 | 120
2 | 2, 9, 5, 15	2 | 60
3 | 1, 9, 5, 15	2 | 30
3 | 1, 3, 5, 5	3 | 15
5 | 1, 1, 5, 5	5 | 5
1, 1, 1, 1	1

LCM - $2 \times 2 \times 2 \times 3 \times 3 \times 5$

$= 360$

$240 = \overline{2 \times 2} \times (2) \times 2 \times \overline{3 \times 3} \times (5)$

$= 2 \times 5 = 10$

To make it a perfect square number, it must be multiplied by 2×5, i.e., by 10

Hence the required number $= 360 \times 10 = 3600$

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Square and Square roots, Cube and Cube roots

Properties of a Perfect Square -

I) The square of an even number is always an even number.

II) The square of an odd number is always an odd number.

III) The square of a proper fraction is a proper fraction less than the given fraction.

IV) The square of a decimal fraction less than 1 is smaller than the given decimal.

V) A number ending in 2, 3, 7 or 8 is never a perfect square.

VI) A number ending in an odd number of zeros is never a perfect square.

Interesting Patterns in Squares of Numbers

I) Pythagorean Tiplets - For every natural number $m > 1$, we have $(2m, m^2-1, m^2+1)$ as a Phythagorean triplet.

II) Between two consecutive square numbers n^2 and $(n+1)^2$, there are $2n$ non-perfect square number.

III) using the identity $(a+b^2) = (a^2+2ab+b^2)$ to

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evaluate square of numbers.

IV.) using the identity $(a-b)^2 = (a^2-2ab+b^2)$ to evaluate squares of numbers.

V.) using the identity $(a-b)(a+b) = a^2-b^2$ to find the product of two consecutive odd or two consecutive even numbers.

Exercise 3-B

Ques-1 Give reason to show that none of the numbers is a perfect square-

i) 2162

2162 is not a perfect square because a number ending 2, 3, 7 or 8 is never a perfect square.

ii.) 6843

6843 is not a perfect square because a number ending 2, 3, 7 or 8 is never a perfect square.

iii.) 9637

9637 is not a perfect square because a number ending 2, 3, 7 or 8 is never a perfect square.

iii) 6543

6543 is not a perfect square because a number ending 2, 3, 7 or 8 is never a perfect square.

iv) 640

640 is not a perfect square because a number ending in an odd number of zeros is never a perfect square.

v) 49000

49000 is not a perfect square because a number ending in an odd number of zeros is never a perfect square.

vii) 3600000

3600000 is not a perfect square because a number ending in an odd number of zeros is never a perfect square.

Q2. Which of the following are squares of even numbers?

i) 676 ii) 729 iii) 1089 iv) 2304 v) 5625
vi) 9216

The square of an even number is always an even number.
676, 2304 and 9216 are squares of even numbers.

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Ques3 Which of the following are squares of odd numbers?

i) 484 ii) 961 iii) 4225 iv) 7396
v) 6241 vi) 8649

The square of an odd number is always an odd number.
961, 4225, 8649 are squares of odd numbers

Ques4 Without adding find the sum:-

i) $1+3+5+7+9+11+13+15+17+19+21$

$=(11)^2 = 11\times11 = 121$

ii) $1+3+5+7+\ldots\ldots\ldots\ldots+47+49$

$=(25)^2 = 25\times25 = 625$

iii) $1+3+5+7+\ldots\ldots\ldots\ldots+97+99$

$=(50)^2 = 50\times50 = 2500$

Ques-5i) Express 144 as the sum of 12 odd numbers

$144 = 1+3+5+7+9+11+13+15+17+19+21+23$

ii) Express 225 as the sum of 15 odd numbers

$225 = 1+3+5+7+9+11+13+15+17+19+21+23+25+27+29$

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Q.6 Write a phythagorean tiplet whose smallest number is-

i) 6

Pythagorean triplets are - $2n, n^2-1, n^2+1$

$2n = 6 = \frac{6}{2} = 3$

$n = 3$

Phytagorean triplets are = $2\times3, 3^2-1, 3^2+1$

$= 6, 9-1, 9+1$

$= 6, 8, 10$

ii) 14

Pythagorean triplets are = $2n, n^2-1, n^2+1$

$2n = 6^{14} = \frac{14}{2} = 7$

$n = 7$

Pythagorean triplets are = $2\times7, 7^2-1, 7^2+1$

$= 14, 49-1, 49+1$

$= 14, 48, 50$

ii) 16

Pythagorean triplets are = $2n, n^2-1, n^2+1$

$2n = 16 = \frac{16}{2} 8 = 8 \Rightarrow n = 8$

Phytagorean triplets are = $2\times8, 8^2-1, 8^2+1$

$= 16, 64-1, 64+1$

$= 16, 63, 65$

iv) 20

Pythagorean triplets are = $2n, n^2-1, n^2+1$

$2n = 20 = \frac{20}{2}$ $b = 10$

Pythagorean triplets are $= 2\times10, 10^2-1, 10^2+1$
$= 20, 100-1, 100+1$
$= 20, 99, 101$

Q.7 Evaluate :-

(i) $(29)^2 - (28)^2$

$(n+1)^2 - n^2 = (n+1)+n$
$(29)^2 - (28)^2 = 29+28$
$= 57$

ii) $(56)^2 - (55)^2$

$(n+1)^2 - n^2 = (n+1)+n$
$(56)^2 - (55)^2 = 56+55$
$= 111$

iii) $(82)^2 - (81)^2$

$(n+1)^2 - n^2 = (n+1)+n$
$(82)^2 - (81)^2 = 82+81$
$= 163$

iv) $(108)^2 - (107)^2$
$(n+1)^2 - n^2 = (n+1)+n$
$(108)^2 - (107)^2 = 108+107 = 215$

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v.) $(221)^2 - (220)^2$

$(n+1)^2 - n^2 = (n+1)+n$

$(221)^2 - (220)^2 = 221 + 220$

$= 441$ #

Q-8 using the identity $(a+b)^2 = (a^2+2ab+b^2)$, evaluate:-

i) $(204)^2$

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

$(204)^2 = (200+4)^2$

$= (200)^2 + 2 \times 200 \times 4 + 4^2$

$= 40000 + 1600 + 16$

$= 41616$

ii.) $(307)^2$

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

$(307)^2 = (300+7)^2$

$= (300)^2 + 2 \times 300 \times 7 + 7^2$

$= 90000 + 4200 + 49$

$= 94249$

iii.) $(430)^2$

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

$(430)^2 = (400+30)^2$

$= (400)^2 + 2 \times 400 \times 30 + 30^2$

$= 160000 + 24000 + 900$

$= 184900$

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Q-9 using the identity $(a-b)^2 = (a^2 - 2ab + b^2)$, evaluate:

(i) $(94)^2$

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

$(94)^2 = (100-6)^2$

$= 100^2 - 2 \times 100 \times 6 + 6^2$

$= 10000 - 1200 + 36$

$= 10036 - 1200$

$= 8866$

(ii) $(192)^2$

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

$(192)^2 = (200-8)^2$

$= 200^2 - 2 \times 200 \times 8 + 8^2$

$= 40000 - 3200 + 64$

$= 40064 - 3200$

$= 36864$

(iii) $(389)^2$

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

$(389)^2 = (400-11)^2$

$= 400^2 - 2 \times 400 \times 11 + 11^2$

$= 160000 - 8800 + 121$

$= 160121 - 8800$

$= 151321$

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8-10 Evaluate:-

i) 59×61

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

$= (60-1) \times (60+1)$
$= 60^2 - 1^2$
$= 3600 - 1$
$= 3599$

ii) 88×92

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

$= (90-2) \times (90+2)$
$= 90^2 - 2^2$
$= 8100 - 4$
$= 8096$

iii) 94×106

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

$= (100-6)(100+6)$
$= 100^2 - 6^2$
$= 10000 - 36$
$= 10964$

iv) 48×52

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

$(50-2)(50+2)$

- $50^2 - 2^2$
- $2500 - 4$
- 2496

Q-11 State whether each of the following statements is true or false:-

i.) A perfect square number always has an even number of digits.
False.

ii.) Every number ending in an even number of zeros is a perfect square.
(i.) False

iii.) The square of a prime number is prime.

(i.) False

iv.) There are 10 perfect squares ~~its a perfect squar~~ numbers from 1 to 100.
v.) True

v.) The sum of two perfect squares is a perfect square.
False

vi.) The difference of two perfect squares is a perfect square. False

vii.) The product of two perfect squares is a perfect square. True

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Exercise 3-C

Q1 i) 57 Find the square root of each of the following numbers by using division methods.-

i) 576

$$\begin{array}{r|l} 2 & \overline{5\,76}\ (24 \\ 2 & -4 \downarrow\downarrow \\ 44 & 176 \\ & -176. \\ & \times\times\times \end{array}$$

$\sqrt{576} = 24$

ii) 961

$$\begin{array}{r|l} 3 & \overline{9\,61}\ (31 \\ 3 & -9 \downarrow\downarrow \\ 91 & \times 61 \\ & -61 \\ & \times\times \end{array}$$

$\sqrt{961} = 31$

iii) 1444

$$\begin{array}{r|l} 3 & \overline{14\,44}\ (38 \\ 3 & -9 \downarrow\downarrow \\ 68 & 5\,44 \\ & -544 \\ & \times\times\times \end{array}$$

$= \sqrt{1441} = 38$

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iv.) 4489

6	$\overline{44}\ \overline{89}$ (67
6	36 ↓↓
127	x 8 89
	- 8 89
	x x x

$\sqrt{4489} = 67$

v.) 6241

7	$\overline{62}\ \overline{41}$ (79
7	- 49 ↓↓
149	13 41
	- 13 41
	x x x x

$\sqrt{6241} = 79$

vi.) 5476

7	$\overline{54}\ \overline{76}$ (74
7	49 ↓↓
144	5 76
	- 5 76
	x x x

$\sqrt{5476} = 74$

vii.) 9025

9	90 25	(95
9	81	
185	925	
	-925	
	xxx	

$\sqrt{9025} = 95$

	7569	
8	75 69	)87
8	64	
167	1169	
	-1169	
	xx xx	

$\sqrt{7569} = 87$

Q2 The area of a square field is 7744 sq. metres. Find its perimeter.

Area of square = Side x Side

7744 sq. metres = Side x Side

Side = $\sqrt{7744}$

8	77 44	(88
8	-64	
168	1344	
	-1344	
	xxxx	

$\sqrt{7744} = 88$ = Side of square is 88cm.

Q-3 Find the least number which must be subtracted from 1104 to obtain a perfect square. Find this perfect square and its square root.

3	11 04	(33
3	-9 ↓↓	
63	2 04	
	-189	
	x 15	

Remainder = 15
∴ No Subtracted = 15

Perfect square number = 1104 - 15
= 1089

$\sqrt{1089} = 33$

Q-4 Find the least number which must be ~~added~~ subtracted to ~~2203~~ 7126 to obtain a perfect square. Find this perfect square and its square root.

8	79 56	)(
8	64 ↓↓	
169	15 56	
	-1556	
	xxxx	

Remainder = 35
∴ Number Subtracted = 35

Perfect square number = 7956 - 35
= 7921

$\sqrt{7921} = 89$

Ques 5 Find the least number which must be added to 6203 to obtain a perfect square. Find the perfect square and its square root.

7	$\overline{62}\ \overline{03}$	(78
7	49 ↓↓	
148	13 03	
	-11 84	
	× 119	

$78^2 < 6203 < 79^2$

$79^2 = 6241$

No. added = 6241 - 6203
= 38

Perfect square number = 6241

$\sqrt{6241} = 79$

Ques 6 Find the least number which must be added to 7348 to obtain a perfect square. Find the perfect square and its square root.

8	$\overline{73}\ \overline{48}$	(85
8	64 ↓↓	
165	× 948	
	-948	
	× × ×	

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$85^2 < 7348 < 86^2$

$86^2 = 7396$

Number added $= 7396 - 7348$
$= 48$

Perfect square number $= 7396$

$\sqrt{7396} = 86$

Q-7 Find the greatest number of six digits, which is a perfect square. Find the square root of this number.

Greatest number of six digits = 999999

Let us try to find the square root of 999999

9	$\overline{99}\ \overline{99}\ \overline{99}$) 994
9	-81
184	899
+ 4	-736
~~3688~~	16399
1884	-14736
	X1663

clearly $(994)^2$ is less than 999999 by 1663

So the least number to be subtracted is 1663

Hence the required number
$= 999999 - 1663 = 998336$

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Ques 8 Find the least number of four ~~digits~~ digits which is a perfect square

∴ Greatest Number of 3 digit = 999

$$\begin{array}{r|l} 3 & \overline{999} \ (31 \\ 3 & 9\downarrow\downarrow \\ 61 & \times 99 \\ & -61 \\ & \hline & 38 \end{array}$$

$31^2 < 999 < 32^2$

Required Number $= 32^2 = 1024$

Ques 9 Find the least number by which 691692 must be (i) decreased ii) increased iii) multiplied iv) divided, to make it a perfect square.

$$\begin{array}{r|l} 2 & \overline{69\,16\,92} \ (263 \\ 2 & 4\downarrow\downarrow \\ 46 & 291 \\ 6 & 276 \\ 523 & 1592 \\ & -1569 \\ & \hline & XX23 \end{array}$$

i) Number to be decreased = 23

ii) $263^2 < 69192 < 264^2$

$264^2 = 69696$

$69696 - 69192 = 508$

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Ques 8 Find the least number of four digits which is a perfect square

Greatest Number of 3 digit = 999

$$\begin{array}{r|l} 3 & \overline{999}\ (31 \\ 3 & 9\downarrow\downarrow \\ 61 & \times 99 \\ & -61 \\ & \hline & 38 \end{array}$$

$31^2 < 999 < 32^2$

Required Number $= 32^2 = 1024$

Ques 9 Find the least number by which 691692 must be (i) decreased ii) increased iii) multiplied iv) divided, to make it a perfect square.

$$\begin{array}{r|l} 2 & \overline{69}\,\overline{16}\,\overline{92}\ (263 \\ 2 & 4\downarrow\downarrow \\ 46 & 291 \\ 6 & 276 \\ 523 & 1592 \\ & -1569 \\ & \hline & XX23 \end{array}$$

i) Number to be decreased = 23

ii) $263^2 < 69192 < 264^2$

$264^2 = 69696$

Number increased = $69696 - 69192 = 508$

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iii.)

2	69192
2	34596
2	17298
3	8649
3	2883
31	961
31	31
	1

$69192 = 2 \times 2 \times 2 \times 3 \times 3 \times 31 \times 31$

Number multiplied - 2

iv) No divided - 2