7.

	411
4	$\overline{16}\,\overline{89}\,\overline{21}$
+4	16
81	89
+1	81
821	821
+1	821
	0

$\therefore \sqrt{168921} = 411$

8.

	156
1	$\overline{2}\,\overline{43}\,\overline{36}$
+1	1
25	143
+5	125
306	1836
+6	1836
	0

$\therefore \sqrt{24336} = 156$

9.

	140
1	$\overline{1}\,\overline{96}\,\overline{00}$
+1	1
24	96
+4	96
	00

$\therefore \sqrt{19600} = 140$

10.

	625
6	$\overline{39}\,\overline{06}\,\overline{25}$
+6	36
122	306
+2	244
1245	6225
+5	6225
	0

$\therefore \sqrt{390625} = 625$

11. Find the least number that should be subtracted from 99880 to make a perfect square.

Sol.

	316
3	$\overline{9}\,\overline{98}\,\overline{80}$
+3	9
61	98
+1	61
626	3780
+6	3756
	24

The least number to be subtract from 99880 is 24.

7.

	411
4	$\overline{16}\,\overline{89}\,\overline{21}$
+4	16
81	89
+1	81
821	821
+1	821
	0

$\therefore \sqrt{168921} = 411$

8.

	156
1	$\overline{2}\,\overline{43}\,\overline{36}$
+1	1
25	143
+5	125
306	1836
+6	1836
	0

$\therefore \sqrt{24336} = 156$

9.

	140
1	$\overline{1}\,\overline{96}\,\overline{00}$
+1	1
24	96
+4	96
	00

$\therefore \sqrt{19600} = 140$

10.

	625
6	$\overline{39}\,\overline{06}\,\overline{25}$
+6	36
122	306
+2	244
1245	6225
+5	6225
	0

$\therefore \sqrt{390625} = 625$

11. Find the least number that should be subtracted from 99880 to make a perfect square.

Sol.

	316
3	$\overline{9}\,\overline{98}\,\overline{80}$
+3	9
61	98
+1	61
626	3780
+6	3756
	24

The least number to be subtract from 99880 is 24.

12. Find the least number that should be subtracted from 423922 to make a perfect square. Also, find the square root of the perfect square.

Sol.

	651
6	$\overline{42}\,\overline{39}\,\overline{22}$
+6	36
125	639
+5	625
1301	1422
+1	1301
	121

The least number to be subtracted from 423922 is 121.

Required perfect square =

= 423922 − 121

= 423801

48 − 3 = 45 | 24 − 11 = 13
45 − 5 = 40 | 13 − 13 = 0
40 − 7 = 33

Since, we performed subtraction for 7 times,

i.e. $\sqrt{49} = 7$.

EXERCISE 3.3

Evaluate (Q 1 to 10) :

1. $\sqrt{33856}$ 2. $\sqrt{42849}$ 3. $\sqrt{4761}$ 4. $\sqrt{3249}$ 5. $\sqrt{105625}$
6. $\sqrt{511225}$ 7. $\sqrt{168921}$ 8. $\sqrt{24336}$ 9. $\sqrt{19600}$ 10. $\sqrt{390625}$

Sol. 1.

	184
1	3 38 56
+1	1
28	2 38
+8	2 24
364	14 56
+4	14 56
	0

$\therefore \sqrt{33856} = 184$

2.

	207
2	4 28 49
+2	4
407	28 49
+7	28 49
	0.

$\therefore \sqrt{42849} = 207$

3.

	69
6	47 61
+6	36
129	11 61
+9	11 61
	0

$\therefore \sqrt{4761} = 69$

4.

	57
5	32 49
+5	25
107	7 49
+7	7 49
	0

$\therefore \sqrt{3249} = 57$

5.

	325
3	10 56 25
+3	9
62	1 56
+2	1 24
645	32 25
+5	32 25
	0

$\therefore \sqrt{105625} = 325$

6.

	715
7	51 12 25
+7	49
141	2 12
+1	1 41
1425	71 25
+5	71 25
	0

$\therefore \sqrt{511225} = 715$

7.

	411
4	16 89 21
+4	16
81	89
+1	81
821	821
+1	821

8.

	156
1	2 43 36
+1	1
25	1 43
+5	1 25
306	18 36
+6	18 36

(ii) $n = 121$

$121 - 1 = 120$	$85 - 13 = 72$
$120 - 3 = 117$	$72 - 15 = 57$
$117 - 5 = 112$	$57 - 17 = 40$
$112 - 7 = 105$	$40 - 19 = 21$
$105 - 9 = 96$	$21 - 21 = 0$
$96 - 11 = 85$	

Since, we performed subtraction for 11 times.

i.e. $\sqrt{121} = 11$.

(iii) $n = 81$

$81 - 1 = 80$	$56 - 11 = 45$
$80 - 3 = 77$	$45 - 13 = 32$
$77 - 5 = 72$	$32 - 15 = 17$
$72 - 7 = 65$	$17 - 17 = 0$
$65 - 9 = 56$	

Since, we performed subtraction for 9 times.

i.e. $\sqrt{81} = 9$.

(iv) $n = 49$

$49 - 1 = 48$	$33 - 9 = 24$
$48 - 3 = 45$	$24 - 11 = 13$
$45 - 5 = 40$	$13 - 13 = 0$
$40 - 7 = 33$	

Since, we performed subtraction for 7 times,

i.e. $\sqrt{49} = 7$.

6. **The students of a class contributed money for a relief camp. Each child contributed as many rupees as the number of children in the class. If the total collection is ₹ 5184, find the strength of the class.**

Sol. Let no. of students in the class $= x$

Then, Contribution of each student $= x$

$\therefore x \times x = ₹\,5184 \Rightarrow x^2 = 5184$

$\Rightarrow x = \sqrt{5184}$

$\Rightarrow x = \sqrt{2\times2\times2\times2\times2\times2\times3\times3\times3\times3}$

$\Rightarrow x = 2\times2\times2\times3\times3$

$\Rightarrow x = 72.$

2	5184
2	2592
2	1296
2	648
2	324
2	162
3	81
3	27
3	9
3	3
	1

Hence, no. of students in the class $= 72$.

7. Find the square root of the following by repeated subtraction :

(i) 64 (ii) 121 (iii) 81 (iv) 49

Sol. Subtract 1, 3, 5, 7, ... successively from the given number say n.

(i) $n = 64$.

$64 - 1 = 63$
$63 - 3 = 60$
$60 - 5 = 55$
$55 - 7 = 48$
$48 - 9 = 39$
$39 - 11 = 28$
$28 - 13 = 15$
$15 - 15 = 0$

Since, we performed subtraction for 8 times.

i.e. $\sqrt{64} = 8$.

(iv) Number of digits in the Square root 524176 $= \frac{6}{2} = 3$

(v) Number of digits in the Square root 1413721 $= \frac{7+1}{2} = 4$

(vi) Number of digits in the Square root 10588516 $= \frac{8}{2} = 4$

(vii) Number of digits in the Square root 1061912569 $= \frac{10}{2} = 5$.

5. **In an auditorium, the number of rows is equal to the number of the chairs in each row. If the capacity of the auditorium is 2304, find the number of rows in the auditorium.**

Sol. Let the number of rows in the auditorium be x.

$\therefore$ Total number of chairs $= x \times x = x^2$

But total number of chair (capacity) $= 2304$.

$x^2 = 2304$

$\Rightarrow x = \sqrt{2304}$

$\Rightarrow x = \sqrt{\underline{2\times2}\times\underline{2\times2}\times\underline{2\times2}\times\underline{2\times2}\times\underline{3\times3}}$

$\Rightarrow x = 2\times2\times2\times2\times3$

$\Rightarrow x = 48$

2	2304
2	1152
2	576
2	288
2	144
2	72
2	36
2	18
3	9
3	3
	1

Hence, Number of rows in the auditorium $= 48$.

(iv) $1300 = 2\times2\times5\times5\times13$

Since the prime factor 13 is not in a pair we divide 1300 by 13 to get 100, which has prime factors in pairs.

$100 = 2\times2\times5\times5$

$\sqrt{100} = 2\times5 = 10$.

(v) $24000 = \underline{2\times2}\times\underline{2\times2}\times\underline{2\times2}\times3\times5\times\underline{5\times5}$

Since the prime factor $3\times5=15$ is not in a pair we divide 24000 by 15 to get 1600, which has prime factors in pairs.

$1600 = 2\times2\times2\times2\times2\times2\times5\times5$

$\therefore \sqrt{1600} = 2\times2\times2\times5 = 40$.

4. Without any **calculation, find the number of digits. in the square root of each of the** following numbers :

(i) 961 **(ii) 4489** **(iii) 63001** **(iv) 524176** (v) 1413721

(vi) 10588516 **(vii) 1061912569**

Sol. We know that, If a perfect square is of n digits, then its square root will have $\frac{n}{2}$ digits if n is even or $\frac{n+1}{2}$ digits if n is odd.

(i) Number of digits in the square root 961 $= \frac{3+1}{2} = 2$

(ii) Number of digits in the square root 4489 $= \frac{4}{2} = 2$

(iii) Number of digits in the square root 63001 $= \frac{5+1}{2} = 3$.

3. For each of the numbers in Q. 2, find the smallest number by which it should be divided so as to get a perfect square. Also, find the square root of the perfect square.

Sol. (i) $1250 = 2 \times 5 \times 5 \times 5 \times 5$

Since the prime factor 2 is not in pair, we divide 1250 by 2 to get 625, which has prime factors in pairs.

$\therefore 625 = 5 \times 5 \times 5 \times 5$.

$\Rightarrow \sqrt{625} = 5 \times 5 = 25$.

(ii) $7350 = 2 \times 3 \times 5 \times 5 \times 7 \times 7$.

Since the prime factor $(2 \times 3 = 6)$ is not in pair, we divide 7350 by 6 to get 1225, which has prime factors in pairs.

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

$\sqrt{1225} = 5 \times 7 = 25$.

(iii) $47068 = 2 \times 2 \times 7 \times 41 \times 41$

Since the prime factor 7 is not in pair, we divide 47068 by 7 to get 6724, which has prime factors in pairs.

$\therefore 6724 = 2 \times 2 \times 41 \times 41$

$\sqrt{6724} = 2 \times 41 = 82$

5	65
13	13
	1

Since the prime factor 13 does not occur in pair, 1300 is not a perfect square. 1300 should multiplied by 13. So that 13 also occurs in pair and the product 16900 is a perfect square.

$16900 = 2 \times 2 \times 5 \times 5 \times 13 \times 13$

$\sqrt{16900} = 2 \times 5 \times 13 = 130.$

(v) $24000 = \underline{2 \times 2} \times \underline{2 \times 2} \times \underline{2 \times 2} \times 3 \times \underline{5 \times 5} \times 5$

2	24000
2	12000
2	6000
2	3000
2	1500
2	750
3	375
5	125
5	25
5	5
	1

Since the prime factor $(3 \times 5 = 15)$ does not occur in pair 24000 is not a perfect square. 2400 should multiplied by $3 \times 5 = 15$. So that 15 also occurs in pair and the product 360000.

$360000 = \underline{2 \times 2} \times \underline{2 \times 2} \times \underline{2 \times 2} \times \underline{3 \times 3} \times \underline{5 \times 5} \times \underline{5 \times 5}$

$\sqrt{360000} = 2 \times 2 \times 2 \times 3 \times 5 \times 5$

$= 600$

5	245
7	49
7	7
	1

Since the prime factor $(2 \times 3 = 6)$ does not occur in pair, 7350 is not a perfect square. 7350 should be multiplied by 6. So that 2 and 3 also occurs in pair and the product 44100 is a perfect square.

$$44100 = 2 \times 2 \times 3 \times 3 \times 5 \times 5 \times 7 \times 7$$

$$\sqrt{44100} = 2 \times 3 \times 5 \times 7 = 210.$$

(iii) $47068 = 2 \times 2 \times 7 \times 41 \times 41$

2	47068
2	23534
7	11767
41	1681
41	41
	1

Since the prime factor 7 does not occur in pair, 47068 is not a perfect square. 47068 should be multiplied by 7 so that 7 also occurs in pair and the product 329476 is a perfect square.

$$329476 = 2 \times 2 \times 7 \times 7 \times 41 \times 41$$

$$\sqrt{329476} = 2 \times 7 \times 41 = 574.$$

(iv) $8836 = 2 \times 2 \times 47 \times 47$

$= (2 \times 47)^2$

$= (94)^2$

2	8836
2	4418
47	2209
47	47
	1

$\therefore \sqrt{8836} = 94$

(v) $1156 = 2 \times 2 \times 17 \times 17$

$= (2 \times 17)^2$

$= (34)^2$

2	1156
2	578
17	289
17	17
	1

$\therefore \sqrt{1156} = 34$.

2. For each of the following, find the smallest number by which it should be multiplied so as to get a perfect square. Also, find the square root of the perfect square.

(i) 1250 (ii) 7350 (iii) 47068 (iv) 1300 (v) 24000

Sol. (i)

$1250 = 2 \times 5 \times 5 \times 5 \times 5$

2	1250
5	625
5	125
5	25
5	5
	1

Since, the prime factor 2 does not occur in pair, 1250 is not a perfect square. 1250 should be multiplied by 2, so that 2 also occurs in pairs and the product 2500 is a perfect square.

$2500 = 2 \times 2 \times 5 \times 5 \times 5 \times 5$

$\sqrt{2500} = 2 \times 5 \times 5 = 50$.

EXERCISE 3.2

1. Find the square root of :

(i) 5929 (ii) 3969 (iii) 12544 (iv) 8836 (v) 1156

Sol. (i) $5929 = 7 \times 7 \times 11 \times 11$

$= (7 \times 11)^2$

$= (77)^2$

7	5929
7	847
11	121
11	11
	1

$\therefore \sqrt{5929} = 77.$

(ii) $3969 = 3 \times 3 \times 3 \times 3 \times 7 \times 7$

$= (3 \times 3 \times 7)^2$

$= (63)^2$

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

$\therefore \sqrt{3969} = 63.$

(iii) $12544 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 7 \times 7$

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

$= (112)^2$

2	12544
2	6272
2	3136
2	1568
2	784
2	392
2	196
2	98
7	49
7	7
	1

$\therefore \sqrt{12544} = 112.$

9. Observe the following patterns and find the missing digits :

$$11^2 = 121$$

$$101^2 = 10201$$

$$1001^2 = 1002001$$

$$10001^2 = 100020001$$

$$100001^2 = 1\,0000\,2\,0000\,1$$

$$10000001^2 = 1\,000000\,2\,000000\,1$$

10. Observe the pattern and find the missing numbers :

$$1^2 + 2^2 + 2^2 = 3^2$$

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

$$3^2 + 4^2 + 12^2 = 13^2$$

$$4^2 + 5^2 + 20^2 = 21^2$$

$$5^2 + 6^2 + 30^2 = 31^2$$

$$6^2 + 7^2 + 42^2 = 43^2$$

11. Observe the following pattern :

$$(25)^2 = (2 \times 3) \times 100 + 25 = 625$$

$$(35)^2 = (3 \times 4) \times 100 + 25 = 1225$$

$$(45)^2 = (4 \times 5) \times 100 + 25 = 2025$$

⋮

$$(85)^2 = (8 \times 9) \times 100 + 25 = 7225$$

Using the above pattern, find the squares of the following numbers :

(i) 235 (ii) 115 (iii) 105 (iv) 65

(iii) let $2m = 20$, $m = 10$

$m^2 - 1 = 10^2 - 1 = 100 - 1 = 99$

$m^2 + 1 = 10^2 + 1 = 100 + 1 = 101$.

$\therefore$ The other two members of the Phyt Triplet are 99 and 101.

66/768

(iv) let $2m = 26$, $m = 13$

$m^2 - 1 = 13^2 - 1 = 169 - 1 = 168$

$m^2 + 1 = 13^2 + 1 = 169 + 1 = 170$

$\therefore$ The other two members of the Phythagorean Triplet are 168 and 170.

8. Without adding, find the sum :

(i) $1 + 3 + 5 + 7$

(ii) $1 + 3 + 5 + 7 + 9 + 11 + 13$

(iii) $1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21 + 23$

Sol. We know that, the sum of first n odd numbers $= n^2$

(i) $1 + 3 + 5 + 7 = 4^2 = 16$

(ii) $1 + 3 + 5 + 7 + 9 + 11 + 13 = 7^2 = 49$.

(iii) $1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21 + 23 = 12^2 = 144$.

$144 + 1225 = 1369 = 37^2$

$\therefore$ (12, 35, 37) is a Pythagorean triplet.

(iv) $8^2 + 15^2 = 64 + 225 = 289 = 17^2$

$\therefore$ (8, 15, 17) is a Pythagorean triplet.

(v) $12^2 + 21^2 = 144 + 441 = 585 \neq 24^2$

$\therefore$ (12, 21, 24) is not a Pythagorean triplet.

(vi) $16^2 + 63^2 = 256 + 3969 = 4225 = 65^2$

$\therefore$ (16, 63, 65) is a Pythagorean triplet.

7. Find the other two members of the Pythagorean triplet, one of whose members is : [HOTS]

(i) 10 (ii) 14 (iii) 20 (iv) 26

Sol. For any natural number m the Pythagorean triplet = $2m$, m^2-1 and m^2+1

(i) Let $2m = 10$, $m = 5$

$m^2-1 = 5^2-1 = 25-1 = 24$

$m^2+1 = 5^2+1 = 25+1 = 26$

$\therefore$ The other two members of the Pythagorean triplet are 24 and 26.

(ii) Let $2m = 14$, $m = 7$

$m^2-1 = 7^2-1 = 49-1 = 48$

$m^2+1 = 7^2+1 = 49+1 = 50$

$\therefore$ The other two members of the Phythagorean triplet are 48 and 50.

5. Using the properties of squares, find the following products : [HOTS]

(i) 32×34 (ii) 59×61 (iii) 99×101 (iv) 1000×1002

Sol. (i) $32 \times 34 = (33-1) \times (33+1)$

$= (33)^2 - (1)^2 = 1089 - 1 = 1088.$

(ii) $59 \times 61 = (60+1)(60+1) = (60)^2 - (1)^2$

$= 3600 - 1 = 3599.$

(iii) $99 \times 101 = (100-1)(100+1) = (100)^2 - (1)^2$

$= 10000 - 1 = 9999.$

(iv) $1000 \times 1002 = (1001-1) \times (1001+1)$

$= (1001)^2 - (1)^2 = 1002001 - 1$

$= 1002000.$

6. In the following identify the Pythagorean triplets :

(i) (3, 4, 5) (ii) (6, 7, 8) (iii) (12, 35, 37)

(iv) (8, 15, 17) (v) (12, 21, 24) (vi) (16, 63, 65)

Sol. (i) $3^2 + 4^2 = 9 + 16 = 25 = 5^2$

$\therefore$ (3, 4, 5) is a Pythagorean triplet.

(ii) $6^2 + 7^2 = 36 + 49 = 85 \neq 8^2$

$\because$ (6, 7, 8) is not a Pythagorean triplet.

(iii) $12^2 + 35^2 = 144 + 1225 = 1369 = 37^2$

$\therefore$ (12, 35, 37) is a Pythagorean triplet.

(iv) $8^2 + 15^2 = 64 + 225 = 289 = 17^2$

(8, 15, 17) is a Pythagorean triplet

(xii) $4761 = \underline{3 \times 3} \times \underline{23 \times 23}$

3	4761
3	1587
23	529
	23

$= (3 \times 23) \times (3 \times 23)$

$= (69)^2$

$\therefore$ 4761 is a perfect square.

3. Using properties of squares, find the values of the following :

(i) $15^2 - 14^2$ (ii) $22^2 - 21^2$ (iii) $51^2 - 50^2$

(iv) $100^2 - 99^2$ (v) $1001^2 - 1000^2$ (vi) $2115^2 - 2114^2$

Sol. (i) $15^2 - 14^2 = (15+14)(15-14) = 29 \times 1 =$

(ii) $22^2 - 21^2 = (22+21)(22-21) = 43 \times 1 = 43$

(iii) $51^2 - 50^2 = (51+50)(51-50) = 101 \times 1 = 101$

(iv) $100^2 - 99^2 = (100+99)(100-99) = 199 \times 1 = 199$

(v) $1001^2 - 1000^2 = (1001+1000)(1001-1000) = 2001 \times 1 = 2001$

(vi) $2115^2 - 2114^2 = (2115+2114)(2115-2114) = 4229 \times 1 = 4229$

4. How many numbers lie between the squares of the following numbers? [HOTS]

(i) 10 and 11 (ii) 15 and 16 (iii) 100 and 101

Sol. We know that, there are $2n$ non perfect square numbers between the squares of the numbers n and $(n+1)$.

(i) Numbers lie between the squares 10 and 11 $= 2 \times 10 = 20$.

(ii) Numbers lie between the squares 15 and 16 $= 2 \times 15 = 30$.

(iii) Numbers lie between the squares 100 and 101 $= 2 \times 100 = 200$.

(vii) $1521 = \underline{3 \times 3} \times \underline{13 \times 13}$

$= (3 \times 13) \times (3 \times 13)$

$= (39)^2.$

3	1521
3	507
13	169
13	13
	1

$\therefore$ 1521 is a perfect square.

(viii) 21952 is not a perfect square since it ends with 2.

(ix) $28324 = \underline{2 \times 2} \times 7081$

2	28324
2	14162
	7081

Since prime factor does not occur twice. So, 28324 is not a perfect square.

(x) $1500 = \underline{2 \times 2} \times \underline{5 \times 5} \times 5 \times 3$

2	1500
2	750
5	375
5	75
5	15
	3

since prime factor does not occur twice. So, 1500 is not a perfect square.

(xi) $2025 = \underline{3 \times 3} \times \underline{3 \times 3} \times \underline{5 \times 5}$

$= (3 \times 3 \times 5) \times (3 \times 3 \times 5)$

$= (45)^2$

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

$\therefore$ 2025 is a perfect square.

2. Check, if the following numbers are **perfect squares** :

(i) 9801	(ii) 343	(iii) 6287	(iv) 3692
(v) 7938	(vi) 2500	(vii) 1521	(viii) 21952
(ix) 28324	(x) 1500	(xi) 2025	(xii) 4761

Sol. (i) $9801 = \underline{3\times3}\times\underline{3\times3}\times\underline{11\times11}$

i.e. $9801 = (3\times3\times11)\times(3\times3\times11)$

i.e. $9801 = (99)^2$

$\therefore$ 9801 is a perfect square.

3	9801
3	3267
3	1089
3	363
11	121
11	11
	1

(ii) $343 = \underline{7\times7}\times7$

Since prime factors does not occur twice. So, 343 is not a perfect square.

7	343
7	49
7	7
	1

(iii) 6287 is not a perfect square since it ends with 7.

(iv) 3692 is not a perfect square since it ends with 2.

(v) 7938 is not a perfect square since it ends with 8.

(vi) $2500 = \underline{2\times2}\times\underline{5\times5}\times\underline{5\times5}$

$= (2\times5\times5)\times(2\times5\times5)$

$= (50)^2$

$\therefore$ 2500 is a perfect square.

2	2500
2	1250
5	625
5	125
5	25
5	5
	1

EXERCISE 3.1

1. Find the squares of the following numbers :

(i) 31 (ii) 49 (iii) 55 (iv) 121
(v) 355 (vi) 1.2 (vii) 0.016 (viii) 6.25
(ix) $\frac{12}{25}$ (x) $\frac{19}{-24}$ (xi) $\frac{-26}{15}$ (xii) $\frac{-16}{17}$

Sol. (i) $(31)^2 = 31 \times 31 = 961$

(ii) $(49)^2 = 49 \times 49 = 2401$

(iii) $(55)^2 = 55 \times 55 = 3025$ (iv) $(121)^2 = 121 \times 121 = 14641$

(v) $(355)^2 = 355 \times 355 = 126025$ (vi) $(1.2)^2 = 1.2 \times 1.2 = 1.44$

(vii) $(0.016)^2 = 0.016 \times 0.016 = 0.000256$

(viii) $(6.25)^2 = 6.25 \times 6.25 = 39.0625$

(ix) $\left(\frac{12}{25}\right)^2 = \frac{12}{25} \times \frac{12}{25} = \frac{144}{625}$

(x) $\left(\frac{19}{-24}\right)^2 = \frac{19}{-24} \times \frac{19}{-24} = \frac{361}{576}$.

(xi) $\left(\frac{-26}{15}\right)^2 = \frac{-26}{15} \times \frac{-26}{15} = \frac{676}{225}$.

(xii) $\left(\frac{-16}{17}\right)^2 = \frac{-16}{17} \times \frac{-16}{17} = \frac{256}{289}$.