

MATHEMATICS NOTES FOR 7TH CLASS (FOR ISLAMABAD)

Chapter 02

**SQUARE & SQUARE
ROOTS**

Exercise 2.1

1. Separate even and odd numbers from the following:

33, 50, 142, 7134, 1111, 3219, 523, 625, 75667, 911756, 778

Ans. Even numbers 50, 142, 7134, 911756

Odd numbers: 33, 1111, 3219, 523, 625, 75667

2. List the prime numbers between 20 and 60.

Ans. 23, 29, 31, 37, 41, 43, 47, 53, 59

3. A prime number when added to 101 gives an odd prime number. Find it.

Ans. 2

4. One of the twin primes is 7. Find other if sum of both numbers is an even number.

Ans. Sum of two prime numbers

= Even number

= 10, 12, 14,

Second prime number = ?

$7 + 3 = 10$

$7 + 5 = 12$

$7 + 7 = 14$

So answer is 3, 5 or 7.

5. Prime number (greatest = 97 two digit)

Ans. When added with 4 = $97 + 4 = 101$

Smallest three digit prime number = 101

6. Express each of the following as sum of two prime numbers:

(a) 34

Ans. $34 = 17 + 17, 29 + 5$

(b) 33

Ans. $33 = 31 + 2$

(c) 42

Ans. $42 = 37 + 5$

(d) 60

Ans. $60 = 23 + 37$

(e) 54

Ans. $54 = 43 + 11$

7. Find pairs of two prime between 40 and 70

Ans. 41, 43 and 59, 61

8. Write the numbers as the sum of two primes:

(a) 36

Ans. $36 = 17 + 19$

(b) 84

Ans. $84 = 41 + 43$

(c) 144

Ans. $144 = 71 + 73$

(d) 60

Ans. $60 = 29 + 31$

9. List 10 composite numbers between 41 and 55.

Ans. 42, 44, 45, 46, 48, 49, 50, 51, 52, 54

10. List 5 consecutive composite numbers between 60 and 70.

Ans. 62, 63, 64, 65, 66.

Exercise 2.2

1. Find the square of the following numbers.

(i) 7

Ans. $7 = 7^2 = 7 \times 7 = 49$

(ii) 9

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Ans. $9 = 9^2 = 9 \times 9 = 81$

(iii) 10

Ans. $10 = 10^2 = 10 \times 10 = 100$

(iv) 13

Ans. $13 = 13^2 = 13 \times 13 = 169$

(v) 16

Ans. $16 = 16^2 = 16 \times 16 = 256$

(vi) 19

Ans. $19 = 19^2 = 19 \times 19 = 361$

(vii) 30

Ans. $30 = 30^2 = 30 \times 30 = 900$

(viii) 100

Ans. $100 = 100^2 = 100 \times 100 = 10000$

(ix) 150

Ans. $150 = 150^2 = 150 \times 150 = 22500$

(x) 21

Ans. $21 = 21^2 = 21 \times 21 = 441$

(xi) 23

Ans. $23 = 23^2 = 23 \times 23 = 529$

(xii) 25

Ans. $25 = 25^2 = 25 \times 25 = 625$

2. Find the square of the following numbers:

(i) $\frac{2}{3}$

Ans. $\frac{2}{3} = \left(\frac{2}{3}\right)^2 = \frac{2}{3} \times \frac{2}{3} = \frac{4}{9}$

(ii) $\frac{16}{13}$

Ans. $\frac{16}{13} = \left(\frac{16}{13}\right)^2 = \frac{16}{13} \times \frac{16}{13} = \frac{256}{169}$

(iii) $\frac{9}{16}$

Ans. $\frac{9}{16} = \left(\frac{9}{16}\right)^2 = \frac{9}{16} \times \frac{9}{16} = \frac{81}{256}$

(iv) $\frac{7}{23}$

Ans. $\frac{7}{23} = \left(\frac{7}{23}\right)^2 = \frac{7}{23} \times \frac{7}{23} = \frac{49}{529}$

(v) 0.3

Ans. $0.3 = (0.3)^2 = 0.3 \times 0.3 = 0.09$

(vi) 0.5

Ans. $0.5 = (0.5)^2 = 0.5 \times 0.5 = 0.25$

(vii) 0.07

Ans. $0.07 = (0.07)^2 = .07 \times .07 = 0.0049$

(viii) 0.09

Ans. $0.09 = (0.09)^2 = .09 \times .09 = 0.0081$

3. Tell which of the following are perfect squares?

(i) 16

Ans. $16 = 2 \times 2 \times 2 \times 2$
 $= 2^2 \times 2^2 = (2 \times 2)^2$

Hence, 16 is a perfect square.

2	16
2	8
2	4
2	2
	1

(ii) 27

Ans. $27 = 3 \times 3 \times 3$
 $= 3^2 \times 3$

Hence, 27 is not a perfect square

3	27
3	9
3	3
	1

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(iii) 48

$$\begin{aligned} \text{Ans. } 48 &= 2 \times 2 \times 2 \times 2 \times 3 \\ &= 2^2 \times 2^2 \times 3 \end{aligned}$$

Hence, 48 is not a perfect square.

2	48
2	24
2	12
2	6
3	3
	1

(iv) 121

$$\begin{aligned} \text{Ans. } 121 &= 11 \times 11 \\ &= (11)^2 \end{aligned}$$

Hence, 121 is a perfect square

11	121
11	11
	1

(v) 64

$$\begin{aligned} \text{Ans. } 64 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \\ &= 2^2 \times 2^2 \times 2^2 \\ &= (2 \times 2 \times 2)^2 \\ &= (8)^2 \end{aligned}$$

Hence, 64 is a perfect square

2	64
2	32
2	16
2	8
2	4
2	2
	1

(vi) 72

$$\begin{aligned} \text{Ans. } 72 &= 2 \times 2 \times 2 \times 3 \times 3 \\ &= 2^2 \times 2^1 \times 3^2 \end{aligned}$$

Hence 72, is not a perfect square.

2	72
2	36
2	18
3	9
3	3
	1

(vii) 1000

$$\begin{aligned} \text{Ans. } 1000 &= 2 \times 2 \times 2 \times 5 \times 5 \times 5 \\ &= 2^2 \times 2^1 \times 5^2 \times 5^1 \end{aligned}$$

Hence 1000 is not a perfect square.

2	1000
2	500
2	250
5	125
5	5
	1

(viii) 625

$$\begin{aligned} \text{Ans. } 625 &= 5 \times 5 \times 5 \times 5 \\ &= 5^2 \times 5^2 \\ &= (5 \times 5)^2 \end{aligned}$$

Hence, 625 is a perfect square.

5	625
5	125
5	25
5	5
	1

4. Find all the perfect squares between 1 and 101.

Ans. The following are perfect squares between 1 and 101.

4, 9, 16, 25, 36, 49, 64, 81, 100.

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$$2^2 = 4$$

$$3^2 = 9$$

$$4^2 = 16$$

$$5^2 = 25$$

$$6^2 = 36$$

$$7^2 = 49$$

$$8^2 = 64$$

$$9^2 = 81$$

$$10^2 = 100 \quad \text{are perfect square.}$$

Exercise 2.3

1. Find the square root of the following:

(i) 196

2	196
2	98
7	49
7	7
	1

$$\begin{aligned}\sqrt{196} &= \sqrt{2 \times 2 \times 7 \times 7} \\ &= 2 \times 7 \\ &= 14\end{aligned}$$

(ii) 225

5	225
5	45
3	9
3	3
	1

$$\begin{aligned}\sqrt{225} &= \sqrt{5 \times 5 \times 3 \times 3} \\ &= 5 \times 3 \\ &= 15\end{aligned}$$

(iii) 144

2	144
2	72
2	36
2	18
3	9
3	3
	1

$$\begin{aligned}\sqrt{144} &= \sqrt{2 \times 2 \times 2 \times 2 \times 3 \times 3} \\ &= 2 \times 2 \times 3 \\ &= 12\end{aligned}$$

2. Compute the following:

(i) $\sqrt{81}$

$$\text{Ans. } \sqrt{81} = \sqrt{9 \times 9} = 9$$

(ii) $\sqrt{169}$

$$\text{Ans. } \sqrt{169} = \sqrt{13 \times 13} = 13$$

(iii) $\sqrt{289}$

$$\text{Ans. } \sqrt{289} = \sqrt{17 \times 17} = 17$$

(iv) $\sqrt{400}$

$$\text{Ans. } \sqrt{400} = \sqrt{20 \times 20} = 20$$

(v) $\sqrt{2^2 \times 3^2}$

$$\text{Ans. } \sqrt{2^2 \times 3^2} = 2 \times 3 = 6$$

(vi) $\sqrt{7^2 \times 8^2}$

$$\text{Ans. } \sqrt{7^2 \times 8^2} = 7 \times 8 = 56$$

3. Find the square root of the following by factorization.

(i) $\sqrt{36} = ?$

2	36
2	18
3	9
3	3
	1

$$\begin{aligned}\sqrt{36} &= \sqrt{2 \times 2 \times 3 \times 3} \\ &= 2 \times 3 \\ &= 6\end{aligned}$$

(ii) $\sqrt{64} = ?$

2	64
2	32
2	16
2	8
2	4
2	2
	1

$$\begin{aligned}\sqrt{64} &= \sqrt{2 \times 2 \times 2 \times 2 \times 2 \times 2} \\ &= 2 \times 2 \times 2 \\ &= 8\end{aligned}$$

(iii) $\sqrt{196} = ?$

13	196
13	13
	1

$$\begin{aligned}\sqrt{196} &= \sqrt{13 \times 13} \\ &= 13\end{aligned}$$

(iv) $\sqrt{324} = ?$

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2	324	$\sqrt{324} = \sqrt{2 \times 2 \times 3 \times 3 \times 3 \times 3}$
2	162	$= 2 \times 3 \times 3$
3	81	$= 18$
3	27	
3	9	
3	3	
	1	

(v) $\sqrt{441} = ?$

3	441	$\sqrt{441} = \sqrt{3 \times 3 \times 7 \times 7}$
3	147	$= 3 \times 7$
7	49	$= 21$
7	7	
	1	

(vi) $\sqrt{484} = ?$

2	484	$\sqrt{484} = \sqrt{2 \times 2 \times 11 \times 11}$
2	242	$= 2 \times 11$
4	121	$= 22$
11	11	
	1	

(vii) $\sqrt{625} = ?$

5	625	$\sqrt{625} = \sqrt{5 \times 5 \times 5 \times 5}$
5	125	$= 5 \times 5$
5	25	$= 25$
5	5	
	1	

(viii) $\sqrt{841} = ?$

29	841	$\sqrt{841} = \sqrt{29 \times 29}$
29	29	$= 29$
	1	

(ix) $\sqrt{961} = ?$

Ans

31	961	$\sqrt{961} = \sqrt{31 \times 31}$
31	31	$= 31$
	1	

(x) $\sqrt{1089} = ?$

3	1089	$\sqrt{1089} = \sqrt{3 \times 3 \times 11 \times 11}$
3	363	$= 3 \times 11$
11	121	$= 33$
11	11	
	1	

(xi) $\sqrt{1225} = ?$

5	1225	$\sqrt{1225} = \sqrt{5 \times 5 \times 7 \times 7}$
5	245	$= 5 \times 7$
7	49	$= 35$
7	7	
	1	

(xii) $\sqrt{1521} = ?$

3	1521	$\sqrt{1521} = \sqrt{3 \times 3 \times 13 \times 13}$
3	507	$= 3 \times 13$
13	169	$= 39$
13	13	
	1	

(xiii) $\sqrt{1024} = ?$

2	1024	
2	512	
2	256	
2	128	
2	64	
2	32	
2	16	
2	8	
2	4	
2	2	
	1	

$1024 = \sqrt{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2}$
 $= 2 \times 2 \times 2 \times 2 \times 2$
 $= 32$

(xiv) $\sqrt{1764} = ?$

2	1764	$\sqrt{1764} = \sqrt{2 \times 2 \times 3 \times 3 \times 7 \times 7}$
2	882	$= 2 \times 3 \times 7$
3	441	$= 42$

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3	147
7	49
7	7
	1

(xv) $\sqrt{2025} = ?$

5	2025
5	405
3	81
3	27
3	9
3	3
	1

$$\begin{aligned}\sqrt{2025} &= \sqrt{5 \times 5 \times 3 \times 3 \times 3 \times 3} \\ &= 5 \times 3 \times 3 \\ &= 45\end{aligned}$$

(xvi) $\sqrt{4096} = ?$

2	4096
2	2048
2	1024
2	512
2	256
2	128
2	64
2	32
2	16
2	8
2	4
2	2
	1

$$\begin{aligned}\sqrt{4096} &= \sqrt{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2} \\ &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \\ &= 64\end{aligned}$$

(xvii) $\sqrt{4225} = ?$

5	4225
5	845
13	169
13	13
	1

$$\begin{aligned}\sqrt{4225} &= \sqrt{5 \times 5 \times 13 \times 13} \\ &= 5 \times 13 \\ &= 65\end{aligned}$$

(xviii) $\sqrt{2116} = ?$

2	2116
2	1058
23	529
23	23
	1

$$\begin{aligned}\sqrt{2116} &= \sqrt{2 \times 2 \times 23 \times 23} \\ &= 2 \times 23 \\ &= 46\end{aligned}$$

(xix) $\sqrt{4356} = ?$

2	4356
2	2178
3	1089
3	363
11	121
11	11
	1

$$\begin{aligned}\sqrt{4356} &= \sqrt{2 \times 2 \times 3 \times 3 \times 11 \times 11} \\ &= 2 \times 3 \times 11 \\ &= 66\end{aligned}$$

(xx) $\sqrt{6400} = ?$

2	6400
2	3200
2	1600
2	800
2	400
2	200
2	100
2	50
5	25
5	5
	1

$$\begin{aligned}\sqrt{6400} &= \sqrt{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 5 \times 5} \\ &= 2 \times 2 \times 2 \times 2 \times 5 \\ &= 80\end{aligned}$$

(xxi) $\sqrt{9801} = ?$

3	9801
3	3267
3	1089
3	363

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11	121
11	11
	1

$$\begin{aligned}\sqrt{9801} &= \sqrt{3 \times 3 \times 3 \times 3 \times 11 \times 11} \\ &= 3 \times 3 \times 11 \\ &= 99\end{aligned}$$

(xxii) $\sqrt{8100} = ?$

2	8100
2	4050
5	2025
5	405
3	81
3	27
3	9
3	3
	1

$$\begin{aligned}\sqrt{8100} &= \sqrt{2 \times 2 \times 5 \times 5 \times 3 \times 3 \times 3 \times 3} \\ &= 2 \times 5 \times 3 \times 3 \\ &= 90\end{aligned}$$

(xxiii) $\sqrt{12100} = ?$

2	12100
2	6050
5	3025
5	605
11	121
11	11
	1

$$\begin{aligned}\sqrt{12100} &= \sqrt{2 \times 2 \times 5 \times 5 \times 11 \times 11} \\ &= 2 \times 5 \times 11 \\ &= 10 \times 11 \\ &= 110\end{aligned}$$

(xiv) $\sqrt{102400} = ?$

2	102400
2	51200
2	25600
2	12800

2	6400
2	3200
2	1600
2	800
2	400
2	200
2	100
2	50
5	25
5	5
	1

$$\begin{aligned}\sqrt{102400} &= \sqrt{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 5 \times 5} \\ &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 5 \\ &= 64 \times 5 \\ &= 320\end{aligned}$$

4. Verify:

(i) $\sqrt{25 \times 16} = \sqrt{25} \times \sqrt{16}$

Ans. $\sqrt{400} = \sqrt{5 \times 5 \times 4 \times 4}$
 $\sqrt{20 \times 20} = 5 \times 4$
 $20 = 20$
 L.H.S. = R.H.S.

(ii) $\sqrt{36 \times 4} = \sqrt{36} \times \sqrt{4}$

Ans. $\sqrt{144} = 6 \times 2$
 $\sqrt{12 \times 12} = 12$
 $12 = 12$
 L.H.S. = R.H.S.

(iii) $\sqrt{49 \times 81} = \sqrt{49} \times \sqrt{81}$

Ans. $\sqrt{3969} = 7 \times 9$
 $\sqrt{63 \times 63} = 63$
 $63 = 63$
 L.H.S. = R.H.S.

(iv) $\sqrt{100 \times 121} = \sqrt{100} \times \sqrt{121}$

Ans. $\sqrt{12100} = \sqrt{10 \times 10 \times 11 \times 11}$
 $\sqrt{11 \times 11 \times 10 \times 10} = 10 \times 11$
 $11 \times 10 = 110$

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- $110 = 110$
L.H.S. = R.H.S.
- (v) $\sqrt{144 \times 169} = \sqrt{144} \times \sqrt{169}$
Ans. $\sqrt{24336} = \sqrt{12 \times 12 \times 13 \times 13}$
 $\sqrt{12 \times 12 \times 13 \times 13} = 12 \times 13$
 $12 \times 13 = 156$
 $156 = 156$
L.H.S. = R.H.S.
5. *Area of a square region is 121m^2 . Find the length of its side.*
Ans. Side of sq = $\sqrt{121} = \sqrt{11 \times 11}$
 $= 11\text{m}$
6. *The area of a square photo frame is 256cm^2 . Find the perimeter of the photo frame.*
Ans. Side of square = $\sqrt{256}$
 $= \sqrt{16 \times 16}$
 $= 16\text{cm}$
Perimeter = $4 \times \text{length of side}$
 $= 4 \times 16$
 $= 64\text{cm}$
7. *Product of a number and its half is 72. Find the number.*
Ans. Suppose number = x
Half = $\frac{x}{2}$
 $x \times \frac{x}{2} = 72$
 $\frac{1}{2}x^2 = 72$
 $x^2 = 72 \times 2$
 $x^2 = 144$
 $\sqrt{x^2} = \sqrt{144}$
 $x = 12$

8. *Area of a square field is 2500m^2 . Find the perimeter of the square field.*
Ans. Side of square = $\sqrt{2500}$
 $= \sqrt{5 \times 5 \times 10 \times 10}$
 $= 50\text{m}$
Perimeter = $50 \times 4 = 200\text{m}$
9. *If 5 litres of paint will cover 16m^2 and you are painting a square pattern, what is the length of square the paint will cover?*
Ans. Length of square = $\sqrt{16}$
 $= \sqrt{4 \times 4}$
 $= 4\text{m}$
10. *Area of a square field is 900m^2 . Find the cost of cementing boundary wall at a rate of Rs. 50 per metre.*
Ans. Side of square = $\sqrt{900}$
 $= \sqrt{30 \times 30} = 30\text{m}$
Perimeter of boundary wall = $30 \times 4 = 120\text{m}$
Cost = length $\times$ rate
 $= 120 \times 50 = \text{Rs. } 6000$
11. *Length of rectangular region is double of its width. Find perimeter if its area is 128cm^2 .*
Ans. Suppose width = x
Length = $2x$
Area = $l \times w = x \times 2x = 128$
 $2x^2 = 128$
 $x^2 = \frac{128}{2} = 64$
 $\sqrt{x^2} = \sqrt{64}$
 $x = 8$
so length = $2x = 16\text{cm}$
width = $x = 8\text{cm}$

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$$\begin{aligned}\text{Perimeter} &= 2(l + w) \\ &= 2(16 + 8) = 48\text{cm}\end{aligned}$$

Exercise 2.4

Find the square root of the following:

1. $\frac{64}{81}$

Ans. $\frac{64}{81} = \sqrt{\frac{8 \times 8}{9 \times 9}} = \frac{8}{9}$

2. $\frac{361}{529}$

Ans. $\frac{361}{529} = \sqrt{\frac{19 \times 19}{23 \times 23}} = \frac{19}{23}$

3. $\frac{256}{625}$

Ans. $\frac{256}{625} = \sqrt{\frac{16 \times 16}{25 \times 25}} = \frac{16}{25}$

4. $\frac{1225}{169}$

Ans. $\frac{1225}{169} = \sqrt{\frac{35 \times 35}{13 \times 13}} = \frac{35}{13}$

$$\begin{array}{r|l} 5 & 1225 \\ 5 & 245 \\ 7 & 49 \\ 7 & 7 \\ & 1 \end{array}$$

5. $\frac{400}{121}$

Ans. $\frac{400}{121} = \sqrt{\frac{20 \times 20}{11 \times 11}} = \frac{20}{11}$

6. $\frac{144}{49}$

Ans. $\frac{144}{49} = \sqrt{\frac{12 \times 12}{7 \times 7}} = \frac{12}{7}$

7. $\frac{3025}{4096}$

Ans. $\frac{3025}{4096} = \sqrt{\frac{55 \times 55}{64 \times 64}} = \frac{55}{64}$

$$\begin{array}{r|l} 5 & 3025 \\ 5 & 605 \\ 11 & 121 \\ 11 & 11 \\ & 1 \end{array} \quad \begin{array}{r|l} 2 & 4096 \\ 2 & 2048 \\ 2 & 1024 \\ 2 & 512 \\ 2 & 256 \\ 2 & 128 \\ 2 & 64 \\ 2 & 32 \\ 2 & 16 \\ 2 & 8 \\ 2 & 4 \\ 2 & 2 \\ & 1 \end{array}$$

8. $\frac{1296}{324}$

Ans. $\frac{1296}{324} = \sqrt{\frac{36 \times 36}{18 \times 18}} = \frac{36}{18} = 2$

$$\begin{array}{r|l} 2 & 1296 \\ 2 & 648 \\ 2 & 324 \\ 2 & 162 \\ 3 & 81 \\ 3 & 27 \\ 3 & 9 \\ 3 & 3 \\ & 1 \end{array} \quad \begin{array}{r|l} 2 & 324 \\ 2 & 162 \\ 3 & 81 \\ 3 & 27 \\ 3 & 9 \\ 3 & 3 \\ & 1 \end{array}$$

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9. $\frac{196}{729}$

Ans. $\sqrt{\frac{196}{729}} = \frac{\sqrt{14 \times 14}}{\sqrt{3 \times 3 \times 3 \times 3 \times 3 \times 3}}$
 $= \frac{14}{3 \times 3 \times 3} = \frac{14}{27}$

3	729
3	243
3	81
3	27
3	9
3	3
	1

10. $\frac{4761}{841}$

Ans. $\sqrt{\frac{4761}{841}} = \frac{\sqrt{3 \times 3 \times 23 \times 23}}{\sqrt{29 \times 29}}$
 $= \frac{3 \times 23}{29} = \frac{69}{29}$

3	4761
3	1587
23	529
23	23
	1

11. $3\frac{22}{49}$

Ans. $\sqrt{3\frac{22}{49}} = \sqrt{\frac{169}{49}}$
 $= \frac{\sqrt{13 \times 13}}{\sqrt{7 \times 7}} = \frac{13}{7} = 1\frac{6}{7}$

12. $\sqrt{3\frac{13}{81}}$

Ans. $\sqrt{3\frac{13}{81}} = \sqrt{\frac{256}{81}} = \sqrt{\frac{16 \times 16}{9 \times 9}}$
 $= \frac{16}{9} = 1\frac{7}{9}$

13. $5\frac{41}{64}$

Ans. $\sqrt{5\frac{41}{64}} = \sqrt{\frac{361}{64}} = \frac{\sqrt{19 \times 19}}{\sqrt{8 \times 8}}$
 $= \frac{19}{8} = 2\frac{3}{8}$

14. $40\frac{41}{64}$

Ans. $\sqrt{40\frac{41}{64}} = \sqrt{\frac{2601}{64}}$
 $= \frac{\sqrt{3 \times 3 \times 17 \times 17}}{\sqrt{8 \times 8}} = \frac{3 \times 17}{8}$
 $= \frac{51}{8} = 6\frac{3}{8}$

3	2601
3	867
17	289
17	17
	1

15. $26\frac{25}{36}$

Ans. $\sqrt{26\frac{25}{36}} = \sqrt{\frac{961}{36}}$
 $= \frac{\sqrt{31 \times 31}}{\sqrt{6 \times 6}} = \frac{31}{6} = 5\frac{1}{6}$

Exercise 2.5

1. Find the square root by factorization for the following:

(i) 0.09

Ans. $\sqrt{0.09} = \sqrt{\frac{9}{100}} = \sqrt{\frac{3}{10}} = 0.3$

(ii) 0.16

Ans. $\sqrt{0.16} = \sqrt{\frac{16}{100}} = \frac{4}{10} = 0.4$

(iii) 12.25

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$$\begin{aligned} \text{Ans. } \sqrt{12.25} &= \sqrt{\frac{1225}{100}} \\ &= \frac{\sqrt{5 \times 5 \times 7 \times 7}}{\sqrt{10 \times 10}} = \frac{5 \times 7}{10} \\ &= \frac{35}{10} = 3.5 \end{aligned}$$

5	1225
5	245
7	49
7	7
	1

(iv) 1.44

$$\begin{aligned} \text{Ans. } \sqrt{1.44} &= \sqrt{\frac{144}{100}} \\ &= \sqrt{\frac{12 \times 12}{10 \times 10}} = \frac{12}{10} = 1.2 \end{aligned}$$

(v) 0.0256

$$\begin{aligned} \text{Ans. } \sqrt{0.0256} &= \frac{256}{10000} \\ &= \frac{\sqrt{16 \times 16}}{\sqrt{100 \times 100}} = \frac{16}{100} = 0.16 \end{aligned}$$

(vi) 0.1936

$$\begin{aligned} \text{Ans. } \sqrt{0.1936} &= \sqrt{\frac{1936}{10000}} \\ &= \sqrt{\frac{2 \times 2 \times 2 \times 2 \times 11 \times 11}{100 \times 100}} \\ &= \frac{2 \times 2 \times 11}{100} = \frac{44}{100} = 0.44 \end{aligned}$$

2	1936
2	968
2	484
2	242
11	121
11	11
	1

(vii) 19.36

$$\begin{aligned} \text{Ans. } \sqrt{19.36} &= \sqrt{\frac{1936}{100}} \\ &= \frac{\sqrt{2 \times 2 \times 2 \times 2 \times 11 \times 11}}{\sqrt{10 \times 10}} \\ &= \frac{2 \times 2 \times 11}{10} = \frac{44}{10} = 4.4 \end{aligned}$$

(viii) 11.56

$$\begin{aligned} \text{Ans. } \sqrt{11.56} &= \sqrt{\frac{1156}{100}} \\ &= \sqrt{\frac{2 \times 2 \times 17 \times 17}{10 \times 10}} \\ &= \frac{2 \times 17}{10} = \frac{34}{10} = 3.4 \end{aligned}$$

2	1156
2	578
17	289
17	17
	1

(ix) 30.25

$$\begin{aligned} \text{Ans. } \sqrt{30.25} &= \sqrt{\frac{3025}{100}} \\ &= \sqrt{\frac{5 \times 5 \times 11 \times 11}{10 \times 10}} \\ &= \frac{5 \times 11}{10} = \frac{55}{10} = 5.5 \end{aligned}$$

5	3025
5	605
11	121
11	11
	1

(x) 0.0441

$$\begin{aligned} \text{Ans. } \sqrt{0.0441} &= \sqrt{\frac{441}{10000}} \\ &= \sqrt{\frac{3 \times 3 \times 7 \times 7}{100 \times 100}} \\ &= \frac{3 \times 7}{100} = \frac{21}{100} = 0.21 \end{aligned}$$

MATHEMATICS NOTES FOR 7TH CLASS (FOR ISLAMABAD)

$$\begin{array}{r} 3 \overline{) 441} \\ 3 \overline{) 147} \\ 7 \overline{) 49} \\ 7 \overline{) 7} \\ 1 \end{array}$$

(xi) 0.1225

$$\text{Ans. } \sqrt{0.1225} = \sqrt{\frac{1225}{10000}}$$

$$= \frac{\sqrt{5 \times 5 \times 7 \times 7}}{\sqrt{100 \times 100}}$$

$$= \frac{5 \times 7}{100} = \frac{35}{100} = 0.35$$

$$\begin{array}{r} 5 \overline{) 1225} \\ 5 \overline{) 245} \\ 7 \overline{) 49} \\ 7 \overline{) 7} \\ 1 \end{array}$$

(xii) 0.0064

$$\text{Ans. } \sqrt{0.0064} = \sqrt{\frac{64}{10000}}$$

$$= \sqrt{\frac{8 \times 8}{100 \times 100}} = \frac{8}{100} = 0.08$$

(xiii) 2.89

$$\text{Ans. } \sqrt{2.89} = \sqrt{\frac{289}{100}}$$

$$= \sqrt{\frac{17 \times 17}{10 \times 10}} = \frac{17}{10} = 1.7$$

$$\begin{array}{r} 17 \overline{) 289} \\ 17 \overline{) 17} \\ 1 \end{array}$$

(xiv) 0.000081

$$\text{Ans. } \sqrt{0.000081} = \frac{9}{100000}$$

$$= \sqrt{\frac{9 \times 9}{1000 \times 1000}} = \frac{9}{1000} = 0.009$$

2. Area of a square region is 43.56 km². Find the length of its side.

Ans. Side of square = $\sqrt{43.56}$

$$\sqrt{\frac{4356}{100}} = \sqrt{\frac{3 \times 3 \times 2 \times 2 \times 11 \times 11}{10 \times 10}}$$

$$= \frac{3 \times 2 \times 11}{10} = \frac{66}{10} = 6.6 \text{ km}$$

$$\begin{array}{r} 3 \overline{) 4356} \\ 3 \overline{) 1452} \\ 11 \overline{) 484} \\ 11 \overline{) 44} \\ 2 \overline{) 4} \\ 2 \overline{) 2} \\ 1 \end{array}$$

3. Find the positive number which when multiplied by itself gives 110.25.

$$\text{Ans. } (\text{Number})^2 = 110.25$$

$$\text{Number} = \sqrt{110.25}$$

$$\sqrt{\frac{11025}{100}} = \sqrt{\frac{5 \times 5 \times 3 \times 3 \times 7 \times 7}{10 \times 10}}$$

$$= \frac{5 \times 3 \times 7}{10} = \frac{105}{10} = 10.5$$

$$\begin{array}{r} 5 \overline{) 11025} \\ 5 \overline{) 2205} \\ 3 \overline{) 441} \\ 3 \overline{) 147} \\ 7 \overline{) 49} \\ 7 \overline{) 7} \\ 1 \end{array}$$

4. What is the length of a side of a square whose area is 23.04 cm².

Ans. Side of square = $\sqrt{23.04}$

$$= \frac{2304}{100}$$

$$= \frac{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 6 \times 6}{10 \times 10}$$

$$= \frac{2 \times 2 \times 2 \times 6}{10} = \frac{48}{10} = 4.8 \text{ cm}$$

MATHEMATICS NOTES FOR 7TH CLASS (FOR ISLAMABAD)

5. Evaluate:

(i) $\left(\frac{1}{2}\right)^2 + \sqrt{0.25}$

Ans. $\left(\frac{1}{2} \times \frac{1}{2}\right) + \frac{5}{10} = \frac{1}{4} + \frac{5}{10}$
 $= \frac{1}{4} + \frac{1}{2} = \frac{1+2}{4} = \frac{3}{4} = 0.75$

(ii) $\sqrt{(0.5)^2 + (1.2)^2}$

Ans. $= \sqrt{0.25 + 1.44}$
 $= \sqrt{1.69} = \sqrt{\frac{169}{100}}$
 $= \sqrt{\frac{13 \times 13}{10 \times 10}} = \frac{13}{10} = 1.3$

(iii) $\sqrt{(0.5)^2 - (0.4)^2}$

Ans. $= \sqrt{0.25 - 0.16}$
 $= \sqrt{0.09} = \sqrt{\frac{9}{100}} = \frac{3}{10} = 0.3$

Review Exercise 2

1. Encircle the correct answer for the following questions.

(i) Twin primes differ by:

- (a) 1 ✓(b) 2
 (c) 3 (d) 4

(ii) A number has two factors one odd and other even. The number is:

- ✓(a) even (b) odd
 (c) infinite (d) prime

(iii) A composite number has:

- (a) 1 factor (b) 2 factors
 ✓(c) more than 2 factors
 (d) none of these

(iv) The square of an odd positive integer is:

- ✓(a) odd (b) even
 (c) odd or even

(d) negative number

(v) The square of an even positive integer is:

- (a) odd ✓(b) even
 (c) odd or even
 (d) negative number

(vi) $\sqrt{5 \times 5 \times 7 \times 7}$ is equal to:

- (a) 5 (b) 7
 (c) 12 ✓(d) 35

(vii) $\sqrt{121} \times \sqrt{144}$ is equal to:

- (a) 11 (b) 12
 ✓(c) 132 (d) 23

(viii) $\sqrt{2\frac{1}{4}}$ is equal to:

- (a) $\frac{2}{3}$ ✓(b) $\frac{3}{2}$
 (c) $\frac{3}{4}$ (d) $\frac{4}{3}$

(ix) $\sqrt{1.21}$ is equal to:

- ✓(a) 1.1 (b) 2.1
 (c) 1.2 (d) 0.1

(x) $\sqrt{\frac{169}{196}}$ is equal to:

- (a) $\frac{12}{13}$ (b) $\frac{13}{15}$
 ✓(c) $\frac{13}{14}$ (d) $\frac{14}{13}$

(xi) $\sqrt{1\frac{7}{9}}$ is equal to:

- (a) $\frac{4}{5}$ ✓(b) $\frac{4}{3}$
 (c) $\frac{3}{4}$ (d) $\frac{5}{3}$

(xii) $\left(\frac{9}{4}\right)^2$ is equal to:

- (a) $\frac{81}{16}$ ✓(b) $\frac{81}{25}$

MATHEMATICS NOTES FOR 7TH CLASS (FOR ISLAMABAD)

(c) $\frac{100}{16}$ (d) $\frac{100}{25}$

(xiii) $\sqrt{5^2 \times 6^2}$ is equal to:

- ✓(a) 30 (b) 36
(c) 25 (d) 24

2. Find the number, which is factor of every number but is neither prime nor composite.

Ans. 1 = Neither composite more prime.

3. Sum of two twin primes is 144 and they lie between 70 and 80. Find them.

Ans. $71 + 73 = 144$

4. Express each of the following as sum of three prime numbers:

- (a) 38 (b) 31 (c) 41

Ans. (a) $38 = 19 + 17 + 2$

(b) $31 = 11 + 17 + 3$

(c) $41 = 13 + 17 + 11$

5. Evaluate: $\sqrt{\frac{2809}{4096}}$

Ans. $\sqrt{\frac{2809}{4096}}$
 $= \sqrt{\frac{53 \times 53}{2 \times 2 \times 2 \times 2 \times 16 \times 16}}$
 $= \frac{53}{2 \times 2 \times 16} = \frac{53}{64}$

2	4096
2	2048
2	1024
2	512
16	256
16	16
	1

6. Calculate: $\sqrt{2 \frac{1337}{3844}}$

Ans. $\sqrt{2 \frac{1337}{3844}} = \sqrt{\frac{9025}{3844}}$
 $= \sqrt{\frac{5 \times 5 \times 19 \times 19}{2 \times 2 \times 31 \times 31}}$
 $= \frac{5 \times 19}{2 \times 31} = \frac{95}{62}$

5	9025	2	3844
5	1805	2	1922
19	361	31	961
19	19	31	31
	1		1

7. Find square root of 4900 using factorization.

Ans. $\sqrt{4900} = \sqrt{2 \times 2 \times 5 \times 5 \times 7 \times 7}$
 $= 2 \times 5 \times 7 = 70$

2	4900
2	2450
5	1225
5	245
7	49
7	7
	1

8. Find square root of 167281 using factorization.

Ans. $\sqrt{167281} = 409$

409	
409	167281
	167281
	0

9. Find square root of 19.36.

Ans. $\sqrt{19.36} = \sqrt{\frac{1936}{100}}$
 $= \sqrt{\frac{2 \times 2 \times 2 \times 2 \times 2 \times 11 \times 11}{10 \times 10}}$
 $= \frac{2 \times 2 \times 11}{10} = \frac{44}{10} = 4.4$

MATHEMATICS NOTES FOR 7TH CLASS (FOR ISLAMABAD)

2	1936
2	968
2	484
2	242
11	121
11	11
	1

10. The product of two positive numbers is 2400. One of them is six times the other. Find the numbers.

Ans. $x \times 6x = 2400$
 $6x^2 = 2400$
 $x^2 = \frac{2400}{6} = 400$

$\sqrt{x^2} = \sqrt{400}$

$x = 20$

2nd number = $6x = 6 \times 20 = 120$

11. 3600 students are asked to stand in different rows. Every row has as many students as there are rows. Find the number of rows.

Ans. Total students = 3600
 Number of rows
 = Number of students in each row
 = $\sqrt{3600}$
 = $\sqrt{6 \times 6 \times 10 \times 10}$
 = $6 \times 10 = 60$

12. Find the perimeter of a square whose area is $6889m^2$.

Ans. Area of square = $6889m^2$

Side of square = $\sqrt{6889}$

$\sqrt{6889} = \sqrt{83 \times 83} = 83m$

Perimeter = $83 \times 4 = 332m$

13. A society collected Rs. 8836. Each member contributed as many rupees as there were members. Find the number of members of the society.

Ans. Total fund = Rs. 8836
 Each member contributed
 = Number of members
 = $\sqrt{8836}$
 = $\sqrt{2 \times 2 \times 47 \times 47}$
 = 2×47
 = 94

2	8836
2	4418
47	2209
47	47
	1