



## Squares and Square Roots Ex 3.4 Q2

**Answer :**

(i) Resolving 441 into prime factors:

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

3	441
3	147
7	49
7	7
	1

Grouping the factors into pairs of equal factors:

$$441 = (3 \times 3) \times (7 \times 7)$$

Taking one factor for each pair, we get the square root of 441:

$$3 \times 7 = 21$$

(ii) Resolving 196 into prime factors:

$$196 = 2 \times 2 \times 7 \times 7$$

2	196
2	98
7	49
7	7
	1

Grouping the factors into pairs of equal factors:

$$196 = (2 \times 2) \times (7 \times 7)$$

Taking one factor for each pair, we get the square root of 196:

$$2 \times 7 = 14$$

(iii) Resolving 529 into prime factors:

$$529 = 23 \times 23$$

23	529
23	23
	1

Grouping the factors into pairs of equal factors:

$$529 = (23 \times 23)$$

Taking one factor for each pair, we get the square root of 529 as 23.

(iv) Resolving 1764 into prime factors:

$$1764 = 2 \times 2 \times 3 \times 3 \times 7 \times 7$$

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

Grouping the factors into pairs of equal factors:

$$1764 = (2 \times 2) \times (3 \times 3) \times (7 \times 7)$$

Taking one factor for each pair, we get the square root of 1764:

$$2 \times 3 \times 7 = 42$$

(v) Resolving 1156 into prime factors:

$$1156 = 2 \times 2 \times 17 \times 17$$

2	1156
2	578
17	289
17	17
	1

Grouping the factors into pairs of equal factors:

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

Taking one factor for each pair, we get the square root of 1156:

$$2 \times 17 = 34$$

(vi) Resolving 4096 into prime factors:

$$4096 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

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

Grouping the factors into pairs of equal factors:

$$4096 = (2 \times 2) \times (2 \times 2) \times (2 \times 2) \times (2 \times 2) \times (2 \times 2) \times (2 \times 2)$$

Taking one factor for each pair, we get the square root of 4096:

$$(2 \times 2) \times (2 \times 2) \times (2 \times 2) = 64$$

(vii) Resolving 7056 into prime factors:

$$7056 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 7 \times 7$$

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

Grouping the factors into pairs of equal factors:

$$7056 = (2 \times 2) \times (2 \times 2) \times (3 \times 3) \times (7 \times 7)$$

Taking one factor for each pair, we get the square root of 705:

$$2 \times 2 \times 3 \times 7 = 84$$

(viii) Resolving 8281 into prime factors:

$$8281 = 7 \times 7 \times 13 \times 13$$

7	8281
7	1183
13	169
13	13
	1

Grouping the factors into pairs of equal factors:

$$8281 = (7 \times 7) \times (13 \times 13)$$

Taking one factor for each pair, we get the square root of 8281:

$$7 \times 13 = 91$$

(ix) Resolving 11664 into prime factors:

$$11664 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3$$

2	11644
2	5832
2	2916
2	1458
3	729
3	243
3	81
3	27
3	9
3	3
	1

Grouping the factors into pairs of equal factors:

$$11664 = (2 \times 2) \times (2 \times 2) \times (3 \times 3) \times (3 \times 3) \times (3 \times 3)$$

Taking one factor for each pair, we get the square root of 11664:

$$2 \times 2 \times 3 \times 3 \times 3 = 108$$

(x) Resolving 47089 into prime factors:

$$47089 = 7 \times 7 \times 31 \times 31$$

7	47089
7	6727
31	961
31	31
	1

Grouping the factors into pairs of equal factors:

$$47089 = (7 \times 7) \times (31 \times 31)$$

Taking one factor for each pair, we get the square root of 47089:

$$7 \times 31 = 217$$

(xi) Resolving 24336 into prime factors:

$$24336 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 13 \times 13$$

2	24336
2	12168
2	6084
2	3042
3	1521
3	507
13	169
13	13
	1

Grouping the factors into pairs of equal factors:

$$24336 = (2 \times 2) \times (2 \times 2) \times (3 \times 3) \times (13 \times 13)$$

Taking one factor for each pair, we get the square root of 24336:

$$2 \times 2 \times 3 \times 13 = 156$$

(xii) Resolving 190969 into prime factors:

$$190969 = 19 \times 19 \times 23 \times 23$$

19	190969
19	10051
23	529
23	23
	1

Grouping the factors into pairs of equal factors:

$$190969 = (19 \times 19) \times (23 \times 23)$$

Taking one factor for each pair, we get the square root of 190969:

$$19 \times 23 = 437$$

(xiii) Resolving 586756 into prime factors:

$$586756 = 2 \times 2 \times 383 \times 383$$

2	586756
2	293378
383	146689
383	383
	1

Grouping the factors into pairs of equal factors:

$$586756 = (2 \times 2) \times (383 \times 383)$$

Taking one factor for each pair, we get the square root of 586756:

$$2 \times 383 = 766$$

(xiv) Resolving 27225 into prime factors:

$$27225 = 3 \times 3 \times 5 \times 5 \times 11 \times 11$$

3	27225
3	9075
5	3025
5	605
11	121
11	11
	1

Grouping the factors into pairs of equal factors:

$$27225 = (3 \times 3) \times (5 \times 5) \times (11 \times 11)$$

Taking one factor for each pair, we get the square root of 27225:

$$3 \times 5 \times 11 = 165$$

(xv) Resolving 3013696 into prime factors:

$$3013696 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 7 \times 7 \times 31 \times 31$$

2	3013696
2	1506848
2	753424
2	376712
2	188356
2	94178
7	47089
7	6727
31	961
31	31
	1

Grouping the factors into pairs of equal factors:

$$3013696 = (2 \times 2) \times (2 \times 2) \times (2 \times 2) \times (7 \times 7) \times (31 \times 31)$$

Taking one factor for each pair, we get the square root of 3013696:

$$2 \times 2 \times 2 \times 7 \times 31 = 1736$$

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