



## Squares and Square Roots Ex 3.1 Q8

**Answer :**

Factorising each number.

$$(i) 16562 = 2 \times 7 \times 7 \times 13 \times 13$$

2	16562
7	8281
7	1183
13	169
13	13
	1

Grouping them into pairs of equal factors:

$$16562 = 2 \times (7 \times 7) \times (13 \times 13)$$

The factor, 2 is not paired. For a number to be a perfect square, each prime factor has to be paired.

Hence, 16562 must be divided by 2 for it to be a perfect square.

The new number would be  $(7 \times 7) \times (13 \times 13)$ .

Furthermore, we have:

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

Hence, the number whose square is the new number is:

$$7 \times 13 = 91$$

$$(ii) 3698 = 2 \times 43 \times 43$$

2	3698
43	1849
43	43
	1

Grouping them into pairs of equal factors:

$$3698 = 2 \times (43 \times 43)$$

The factor, 2 is not paired. For a number to be a perfect square, each prime factor has to be paired.

Hence, 3698 must be divided by 2 for it to be a perfect square.

The new number would be  $(43 \times 43)$ .

Hence, the number whose square is the new number is 43.

$$(iii) 5103 = 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 7$$

3	5103
3	1701
3	567
3	189
3	63
3	21
7	7
	1

Grouping them into pairs of equal factors:

$$5103 = (3 \times 3) \times (3 \times 3) \times (3 \times 3) \times 7$$

The factor, 7 is not paired. For a number to be a perfect square, each prime factor has to be paired.

Hence, 5103 must be divided by 7 for it to be a perfect square.

The new number would be  $(3 \times 3) \times (3 \times 3) \times (3 \times 3)$ .

Furthermore, we have:

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

Hence, the number whose square is the new number is:

$$3 \times 3 \times 3 = 27$$

$$(iv) 3174 = 2 \times 3 \times 23 \times 23$$

2	3174
3	1587
23	529
23	23
	1

Grouping them into pairs of equal factors:

$$3174 = 2 \times 3 \times (23 \times 23)$$

The factors, 2 and 3 are not paired. For a number to be a perfect square, each prime factor has to be paired. Hence, 3174 must be divided by 6 ( $2 \times 3$ ) for it to be a perfect square.

The new number would be  $(23 \times 23)$ .

Hence, the number whose square is the new number is 23.

$$(v) 1575 = 3 \times 3 \times 5 \times 5 \times 7$$

3	1575
3	525
5	175
5	35
7	7
	1

Grouping them into pairs of equal factors:

$$1575 = (3 \times 3) \times (5 \times 5) \times 7$$

The factor, 7 is not paired. For a number to be a perfect square, each prime factor has to be paired.

Hence, 1575 must be divided by 7 for it to be a perfect square.

The new number would be  $(3 \times 3) \times (5 \times 5)$ .

Furthermore, we have:

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

Hence, the number whose square is the new number is:

$$3 \times 5 = 15$$

\*\*\*\*\* END \*\*\*\*\*

