Squares and Square Roots Ex 3.9 Q13

Answer :

On prime factorisation:
4955 is equal to 5 × 991, which means that $\sqrt{4955} = \sqrt{5} \times \sqrt{11}$.
The square root of 991 is not listed in the table; it lists the square roots of all the numbers below 100.
Hence, we have to manipulate the number such that we get the square root of a number less than 100.
This can be done in the following manner:
$\sqrt{4955} = \sqrt{49.55 \times 100} = \sqrt{49.55} \times 10$
Now, we have to find the square root of 49.55.
We have: $\sqrt{49} = 7$ and $\sqrt{50} = 7.071$.
Their difference is 0.071.
Thus, for the difference of 1 (50 − 49), the difference in the values of the square roots is 0.071.
For the difference of 0.55, the difference in the values of the square roots is:
0.55 × 0.0701 = 0.03905
$\therefore \sqrt{49.55} = 7 + 0.03905 = 7.03905$

Finally, we have:
$\sqrt{4955} = \sqrt{49.55} \times 10 = 7.03905 \times 10 = 70.3905$

Squares and Square Roots Ex 3.9 Q14

Answer :

$$\sqrt{\frac{99}{144}} = \frac{\sqrt{3\times3\times11}}{\sqrt{144}}$$
$$= \frac{3\sqrt{11}}{12}$$
$$= \frac{3\times3.3166}{12} \quad \text{(using the square root table to find } \sqrt{11}\text{)}$$
$$= 0.829$$

Squares and Square Roots Ex 3.9 Q15

Answer :

$$\sqrt{\frac{57}{169}} = \frac{\sqrt{3}\times\sqrt{19}}{\sqrt{169}}$$
$$\frac{1.732\times4.3589}{13} \quad \text{(using the square root table to find } \sqrt{3} \text{ and } \sqrt{19}\text{)}$$
$$0.581$$

Squares and Square Roots Ex 3.9 Q16

Answer :

$\sqrt{\frac{101}{169}} = \frac{\sqrt{101}}{\sqrt{169}}$
The square root of 101 is not listed in the table. This is because the table lists the square roots of all the numbers below 100.
Hence, we have to manipulate the number such that we get the square root of a number less than 100.
This can be done in the following manner:
$\sqrt{101} = \sqrt{1.01 \times 100} = \sqrt{1.01} \times 10$
Now, we have to find the square root of 1.01.

We have:
$\sqrt{1} = 1$ and $\sqrt{2} = 1.414$
Their difference is 0.414.
Thus, for the difference of 1 (2 − 1), the difference in the values of the square roots is 0.414.
For the difference of 0.01, the difference in the values of the square roots is:
0.01 × 0.414 = 0.00414
$\therefore \sqrt{1.01} = 1 + 0.00414 = 1.00414$
$\sqrt{101} = \sqrt{1.01} \times 10 = 1.00414 \times 10 = 10.0414$

Finally, $\sqrt{\frac{101}{169}} = \frac{\sqrt{101}}{13 13} = \frac{10.0414}{13} = 0.772$
This value is really close to the one from the key answer.

Squares and Square Roots Ex 3.9 Q17

Answer :

From the square root table, we have:

$\sqrt{13} = 3.606$ and $\sqrt{14} = \sqrt{2} \times \sqrt{7} = 3.742$

Their difference is 0.136.

Thus, for the difference of 1 (14 − 13), the difference in the values of the square roots is 0.136.

For the difference of 0.21, the difference in the values of their square roots is:

$0.136 \times 0.21 = 0.02856$

$\therefore \sqrt{13.21} = 3.606 + 0.02856 \approx 3.635$

********** END **********