Squares and Square Roots Ex 3.6 Q1

Answer :

(i) We know:

$\sqrt{\frac{441}{961}} = \frac{\sqrt{441}}{\sqrt{961}}$

Now, let us compute the square roots of the numerator and the denominator separately.

$\sqrt{441} = \sqrt{(3 \times 3) \times (7 \times 7)} = 3 \times 7 = 21$

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

$\therefore \sqrt{\frac{441}{961}} = \frac{21}{31}$

(ii)We know:

$\sqrt{\frac{324}{841}} = \frac{\sqrt{324}}{\sqrt{841}}$

Now, let us compute the square roots of the numerator and the denominator separately.

$\sqrt{324} = \sqrt{2 \times 2 \times 3 \times 3 \times 3 \times 3} = 2 \times 3 \times 3 = 18$

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

$\therefore \sqrt{\frac{324}{841}} = \frac{18}{29}$

(iii) By looking at the book's answer key, the fraction should be $\sqrt{4\frac{29}{49}}$, not $\sqrt{4\frac{29}{29}}$.

We know:

$\sqrt{4\frac{29}{49}} = \sqrt{\frac{225}{49}} = \frac{\sqrt{225}}{\sqrt{49}}$

$\sqrt{225} = 15$

$\sqrt{49} = 7$

$\therefore \sqrt{4\frac{29}{49}} = \frac{15}{7}$

(iv) We know:

$\sqrt{2\frac{14}{25}} = \sqrt{\frac{64}{25}} = \frac{\sqrt{64}}{\sqrt{25}} = \frac{8}{5}$

(v) We know:

$\sqrt{2\frac{137}{196}} = \sqrt{\frac{529}{196}} = \frac{\sqrt{529}}{\sqrt{196}}$

Now, let us compute the square roots of the numerator and the denominator separately.

$\sqrt{529} = \sqrt{23 \times 23} = 23$

$\sqrt{196} = \sqrt{2 \times 2 \times 7 \times 7} = 2 \times 7 = 14$

$\therefore \sqrt{2\frac{137}{196}} = \frac{23}{14}$

(vi) We know:

$\sqrt{23\frac{26}{121}} = \sqrt{\frac{2809}{121}} = \frac{\sqrt{2809}}{\sqrt{121}}$

Now, let us compute the square roots of the numerator and the denominator separately.

$$\begin{array}{r|l} & 53 \\ \hline 5 & 2809 \\ 5 & 25 \\ \hline 103 & 309 \\ 3 & 309 \\ \hline & 000 \end{array}$$

$\sqrt{121} = 11$

$\therefore \sqrt{23\frac{26}{121}} = \frac{53}{11}$

(vii) We know:

$\sqrt{25\frac{544}{729}} = \sqrt{\frac{18769}{729}} = \frac{\sqrt{18769}}{\sqrt{729}}$

Now, let us compute the square roots of the numerator and the denominator separately.

	137
1	18769
1	1
23	87
3	69
267	1869
7	1869
	0

$\sqrt{729} = 27$

$\therefore \sqrt{25\frac{544}{729}} = \frac{137}{27}$

(viii) We know:

$\sqrt{75\frac{46}{49}} = \sqrt{\frac{3721}{49}} = \frac{\sqrt{3721}}{\sqrt{49}}$

Now, let us compute the square roots of the numerator and the denominator separately.

	61
6	3721
6	36
121	121
1	121
	0

$\sqrt{49} = 7$

$\therefore \sqrt{75\frac{46}{49}} = \frac{61}{7}$

(ix) We know:

$\sqrt{3\frac{942}{2209}} = \sqrt{\frac{7569}{2209}} = \frac{\sqrt{7569}}{\sqrt{2209}}$

Now, let us compute the square roots of the numerator and the denominator separately.

	87
8	7569
8	64
167	1169
7	1169
	0

	47
4	2209
4	16
87	609
7	609
	0

$\therefore \sqrt{3\frac{942}{2209}} = \frac{87}{47}$

(x) We know:

$\sqrt{3\frac{334}{3025}} = \sqrt{\frac{9409}{3025}} = \frac{\sqrt{9409}}{\sqrt{3025}}$

Now, let us compute the square roots of the numerator and the denominator separately.

	97
9	9409
9	81
187	1309
7	1309
	0

	55
5	3025
5	25
105	525
5	525
	0

$\therefore \sqrt{3\frac{334}{3025}} = \frac{97}{55}$

(xi) We know:

$\sqrt{21\frac{2797}{3364}} = \sqrt{\frac{73441}{3364}} = \frac{\sqrt{73441}}{\sqrt{3364}}$

Now, let us compute the square roots of the numerator and the denominator separately.

	271
2	73441
2	4
47	334
7	329
541	541
1	541
	0

	58
5	3364
5	25
108	864
8	864
	0

$\therefore \sqrt{21\frac{2797}{3364}} = \frac{271}{58}$

(xii) We know:

$\sqrt{38\frac{11}{25}} = \sqrt{\frac{961}{25}} = \frac{\sqrt{961}}{\sqrt{25}}$

Now, let us compute the square roots of the numerator and the denominator separately.

$\sqrt{961} = 31$

$\sqrt{25} = 5$

$\therefore \sqrt{38\frac{11}{25}} = \frac{31}{5}$

(xiii) We know:

$$\sqrt{23\frac{394}{729}} = \sqrt{\frac{17161}{729}} = \frac{\sqrt{17161}}{\sqrt{729}}$$

Now, let us compute the square roots of the numerator and the denominator separately.

	131
1	17161
1	1
23	71
3	69
261	261
1	261
	0

$$\sqrt{729} = 27$$

$$\therefore \sqrt{23\frac{394}{729}} = \frac{131}{27} = 4\frac{23}{27}$$

(xiv) We know:

$$\sqrt{21\frac{51}{169}} = \sqrt{\frac{3600}{169}} = \frac{\sqrt{3600}}{169}$$

Now, let us compute the square roots of the numerator and the denominator separately.

$$\sqrt{3600} = \sqrt{60 \times 60} = 60$$

$$\sqrt{169} = \sqrt{13 \times 13} = 13$$

$$\therefore \sqrt{21\frac{51}{169}} = \frac{60}{13} = 4\frac{8}{13}$$

(xv) We know:

$$\sqrt{10\frac{151}{225}} = \sqrt{\frac{2401}{225}} = \frac{\sqrt{2401}}{\sqrt{225}}$$

Now let us compute the square roots of the numerator and the denominator separately.

$$\sqrt{2401} = \sqrt{7 \times 7 \times 7 \times 7} = 7 \times 7 = 49$$

$$\sqrt{225} = \sqrt{3 \times 3 \times 5 \times 5} = 3 \times 5 = 15$$

$$\therefore \sqrt{10\frac{151}{225}} = \frac{49}{15} = 3\frac{4}{15}$$

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