

# Squares and Square Roots

## Exercise 3G

Q1

**Answer :**

$$\sqrt{\frac{16}{81}} = \frac{\sqrt{16}}{\sqrt{81}}$$

$$\sqrt{16} = 4 \text{ and } \sqrt{81} = 9$$

$$\therefore \sqrt{\frac{16}{81}} = \frac{\sqrt{16}}{\sqrt{81}} = \frac{4}{9}$$

Q2

**Answer :**

$$\sqrt{\frac{64}{225}} = \frac{\sqrt{64}}{\sqrt{225}}$$

Using long division method:

$$\sqrt{64} = 8$$

$$\begin{array}{r} 8 \\ 8 \overline{) 64} \\ \underline{8 \phantom{0}} \\ 0 \end{array}$$

$$\sqrt{225} = 15$$

$$\begin{array}{r} 15 \\ 1 \overline{) 225} \\ \underline{1 \phantom{0}} \\ 25 \phantom{0} \\ \underline{25 \phantom{0}} \\ 0 \end{array}$$

$$\therefore \sqrt{\frac{64}{225}} = \frac{\sqrt{64}}{\sqrt{225}} = \frac{8}{15}$$

Q3

$$\sqrt{\frac{121}{256}} = \frac{\sqrt{121}}{\sqrt{256}}$$

Using division method:

$$\sqrt{121} = 11$$

$$\begin{array}{r} 11 \\ 1 \overline{) 121} \\ \underline{1 \phantom{0}} \\ 21 \phantom{0} \\ \underline{21 \phantom{0}} \\ 0 \end{array}$$

$$\begin{array}{r} 16 \\ 1 \overline{) 256} \\ \underline{1 \phantom{0}} \\ 26 \phantom{0} \\ \underline{26 \phantom{0}} \\ 0 \end{array}$$

$$\therefore \sqrt{\frac{121}{256}} = \frac{\sqrt{121}}{\sqrt{256}} = \frac{11}{16}$$

Q4

$$\sqrt{\frac{625}{729}} = \frac{\sqrt{625}}{\sqrt{729}}$$

Using long division method:

$$\begin{array}{r} 25 \\ 2 \overline{) 625} \\ \underline{24} \phantom{0} \\ 452 \phantom{0} \\ \underline{5225} \\ 0 \end{array}$$

$$\sqrt{625} = 25$$

$$\begin{array}{r} 27 \\ 2 \overline{) 729} \\ \underline{24} \phantom{0} \\ 473 \phantom{0} \\ \underline{7329} \\ 0 \end{array}$$

$$\sqrt{729} = 27$$

$$\therefore \sqrt{\frac{625}{729}} = \frac{\sqrt{625}}{\sqrt{729}} = \frac{25}{27}$$

Q5

**Answer :**

$$\begin{aligned} & \sqrt{3 \frac{13}{36}} \\ &= \sqrt{\frac{121}{36}} \\ &= \frac{\sqrt{121}}{\sqrt{36}} \\ &= \frac{\sqrt{11 \times 11}}{\sqrt{6 \times 6}} \\ &= \frac{11}{6} \\ &= 1 \frac{5}{11} \end{aligned}$$

Q6

**Answer :**

$$\sqrt{4 \frac{73}{324}} = \sqrt{\frac{1369}{324}} = \frac{\sqrt{1369}}{\sqrt{324}}$$

Using long division method:

$$\sqrt{1369} = 37$$

$$\begin{array}{r} 37 \\ 3 \overline{) 1369} \\ \underline{39} \phantom{0} \\ 674 \phantom{0} \\ \underline{7469} \\ 0 \end{array}$$

$$\sqrt{324} = \sqrt{2 \times 2 \times 9 \times 9} = 2 \times 9 = 18$$

$$\therefore \sqrt{4 \frac{73}{324}} = \frac{37}{18} = 2 \frac{1}{18}$$

Q7

**Answer :**

$$\sqrt{3 \frac{33}{289}} = \sqrt{\frac{900}{289}} = \frac{\sqrt{900}}{\sqrt{289}}$$

Using long division method:

$$\begin{array}{r} 17 \\ 1 \overline{) 289} \\ \underline{11} \phantom{00} \\ 27 \phantom{00} \\ \underline{71} \phantom{00} \\ 0 \phantom{00} \end{array}$$
$$\sqrt{289} = 17$$

And

$$\sqrt{900} = \sqrt{2 \times 2 \times 5 \times 5 \times 3 \times 3} = 2 \times 5 \times 3 = 30$$

$$\therefore \sqrt{3 \frac{33}{289}} = \frac{30}{17} = 1 \frac{13}{17}$$

Q8

**Answer :**

We have:

$$\begin{aligned} & \frac{\sqrt{80}}{\sqrt{405}} \\ &= \sqrt{\frac{80}{405}} \\ &= \sqrt{\frac{16}{81}} \\ &= \frac{\sqrt{16}}{\sqrt{81}} \\ &= \frac{4}{9} \end{aligned}$$

Q9

**Answer :**

We have:

$$\begin{aligned} & \frac{\sqrt{1183}}{\sqrt{2023}} \\ &= \sqrt{\frac{1183}{2023}} \\ &= \sqrt{\frac{169}{289}} \\ &= \frac{\sqrt{169}}{\sqrt{289}} \\ &= \frac{\sqrt{13 \times 13}}{\sqrt{17 \times 17}} \\ &= \frac{13}{17} \end{aligned}$$

Q10

**Answer :**

We have:

$$\begin{aligned} & \sqrt{98} \times \sqrt{162} \\ &= \sqrt{98 \times 162} \\ &= \sqrt{2 \times 7 \times 7 \times 2 \times 9 \times 9} \\ &= 2 \times 7 \times 9 \\ &= 126 \end{aligned}$$