Cosmo School

Class – 7

Chapter – 1

Rational and Irrational Number

Lecture sheet – 5

Perfect square fraction: When the numerator and denominator of a fraction are perfect square or numerator and denominator of a reduced fraction are perfect square, the fraction is said to be a perfect square fraction.

Example 1: $\frac{50}{32} = \frac{25}{16}$ [Reduced to last form]

Here, the numerator of the fraction $\frac{25}{16}$ is 25, which is a perfect square number and denominator 16 is also a perfect square number.

So, $\frac{25}{16}$ is a perfect square fraction.

Square root of a fraction: The square root of a fraction is determined by dividing the square root of numerator by the square root of denominator of the fraction.

Example 2: Find the square root of $\frac{64}{81}$.

Solution: Given fraction is $\frac{64}{81}$

Square root of the numerator 64 of the fraction = $\sqrt{64}$ = 8

And square root of the denominator 81 of the fraction = $\sqrt{81}$ = 9

∴ Square root of $\frac{64}{81} = \sqrt{\frac{64}{81}} = \frac{8}{9}$

∴ The required square root = $\frac{8}{9}$

Ans: $\frac{8}{9}$.

Example 3: Find the square root of $52\frac{9}{16}$.

Solution: Given fraction, $52\frac{9}{16}$

Square root of $52\frac{9}{16} = \sqrt{52\frac{9}{16}} = \sqrt{\frac{(52 \times 16)+9}{16}} = \sqrt{\frac{841}{16}} = \frac{29}{4} = 7\frac{1}{4}$

∴ Square root of $52\frac{9}{16} = 7\frac{1}{4}$

Ans: $7\frac{1}{4}$.

Example 4: Find the square root of $27\frac{46}{49}$.

Solution: Given fraction, $27\frac{46}{49}$

Square root of $27\frac{46}{49} = \sqrt{27\frac{46}{49}} = \sqrt{\frac{(27 \times 49)+46}{49}} = \sqrt{\frac{1369}{49}} = \frac{37}{7} = 5\frac{2}{7}$

∴ Square root of $27\frac{46}{49} = 5\frac{2}{7}$

Ans: $5\frac{2}{7}$.

1. Exercise (Do yourself)

*Determine the square root of the following fractions:

a) $\frac{1}{64}$ b) $\frac{49}{121}$ c) $11\frac{97}{144}$ d) $32\frac{241}{324}$

If the denominator of a fraction is not a perfect square number then it is to be transformed into perfect square by multiplication.

Example 5: Find the square root of $2\frac{8}{15}$ upto three decimal places.

Solution: The square root of $2\frac{8}{15}$

$$= \sqrt{2\frac{8}{15}}$$

$$= \sqrt{\frac{38}{15}}$$

$$= \sqrt{\frac{38 \times 15}{15 \times 15}}$$

$$= \sqrt{\frac{570}{225}}$$

$$= \frac{23.8747}{15}$$

= 1.5916 (approx)

∴ The square root upto three decimal places = 1.592 (approx)

Ans: 1.592 (approx) .

Rough

$$\begin{array}{r|l} 1 & 2\,\overline{25}\ (\ 15 \\ & 1 \\ \hline 25 & 1\,25 \\ & 1\,25 \\ \hline & 0 \end{array}$$

Rough

```
2      | 5 70.00 00 00 00 ( 23.8746
       | 4
43     | 1 70
       | 1 29
468    |   41 00
       |   37 44
4767   |    3 56 00
       |    3 33 69
47744  |      22 31 00
       |      19 09 76
477486 |       3 21 24 00
       |       2 86 49 16
       |         34 74 84
```

Rough

```
        1.5916
15 ) 23.8747
     15
      88
      75
      137
      135
        24
        15
         97
         90
          7
```

Example 6: Find the square root of $1\frac{8}{5}$ upto two decimal places.

Solution: The square root of $1\frac{8}{5}$

$$= \sqrt{1\frac{8}{5}}$$

$$= \sqrt{\frac{13}{5}}$$

$$= \sqrt{\frac{13 \times 5}{5 \times 5}}$$

$$= \sqrt{\frac{65}{25}}$$

$$= \frac{8.062}{5}$$

= 1.612 (approx)

∴ The square root upto two decimal places = 1.61 (approx)

Ans: 1.61 (approx) .

2. Exercise (Do yourself)

*Determine the square root upto three decimal places:

a) $\frac{6}{7}$ b) $2\frac{5}{6}$ c) $7\frac{9}{13}$