

## Rational Numbers between two given Rational Numbers



We can find unlimited rational numbers between two rational numbers. A number between two rational numbers can be a rational number or a whole number. When denominators are the same.

**Follow the steps given below:**

**Step 1:** Check the values on the numerators of the rational numbers

**Step 2:** Find by how many values, the numerators differ from each other

**Step 3:** Since, the denominators are the same for the two rational numbers, therefore, we can write the rational numbers between the two given rational numbers, in the increasing order of numerator, if the difference between the two numerators is more.

**Step 4:** If the difference between two numerators is less, and we need to find more rational numbers, then multiply the numerator and denominator of the given rational numbers by multiples of 10.



**Let us understand with an Example:**

**Example:** Find 5 rational numbers between  $\frac{4}{5}$  and  $\frac{8}{5}$ .

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⇒ **Solution:** As we can see, the denominators of given rational numbers are the same.

**Now, on comparing numerators,**

$$4 < 8$$

There are only three numbers between 4 and 8, i.e., 5, 6 and 7.

Hence, we will multiply both the rational numbers by  $10/10$ .

$$4/5 \times 10/10 = 40/50$$

$$8/5 \times 10/10 = 80/50$$

Now again comparing the numerators, we can see,

$$80 > 40$$

And there are more than 5 numbers between 40 and 80. Hence, we can take any 5 rational numbers between  $40/50$  and  $80/50$ .

**Therefore,** the five rational numbers are  $41/50$ ,  $42/50$ ,  $45/50$ ,  $50/50$ ,  $55/50$ .

⇒ **When Denominators are Different**

Follow the below steps to find the rational numbers between them.

**Step 1:** Find the LCM of two rational numbers first.

**Step 2:** Multiply and divide the two rational numbers, by the value that results in the denominators equal to the obtained LCM.

**Step 3:** Once the denominators become the same, follow the same rules as we have discussed for the rational numbers with the same denominators.

## Rational Numbers between two given Rational Numbers

⇒ **Let us understand with an example:**

**Example:** Find five rational numbers between  $1/2$  and  $2/3$ .

**Solution:** The two given rational numbers are  $1/2$  and  $2/3$

LCM of denominators (2 and 3) = 6

Therefore, multiply and divide  $1/2$  and  $2/3$  by  $3/3$  and  $2/2$ , respectively.

$$1/2 \times (3/3) = 3/6$$

$$2/3 \times (2/2) = 4/6$$

**Now, the denominators are the same.**

Numerators are 3 and 4. Hence, we cannot find any number in between them.

Thus, we have to multiply again the rational numbers  $3/6$  and  $4/6$  by  $10/10$ , each.

$$3/6 \times 10/10 = 30/60$$

$$4/6 \times 10/10 = 40/60$$

**Therefore,** five rational numbers between  $1/2$  and  $2/3$  are:

$31/60, 32/60, 33/60, 34/60, 35/60$ .