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(Affiliated to CBSE up to +2 Level)

CLASS: X

SUB.: MATHS (NCERT BASED)

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REVISION

1. A fraction becomes $\frac{1}{3}$ when 1 is subtracted from the numerator and it becomes $\frac{1}{4}$ when 8 is added to its denominator. Find the fraction.

Solution: Let the fraction be x/y ,

where x is the numerator and y is the denominator

Fraction becomes $1/3$ when 1 is subtracted from the numerator

$$\Rightarrow (x - 1)/y = 1/3$$

$$\Rightarrow y = 3(x - 1)$$

$$\therefore y = 3x - 3 \text{ _____ (i)}$$

Again It becomes $1/4$ when 8 is added to its denominator.

$$\Rightarrow x/(y + 8) = 1/4$$

Cross multiplication

$$\Rightarrow (y + 8) = 4x$$

$$\Rightarrow 4x = y + 8 \text{ _____ (ii)}$$

Substituting the value of y from Eq. (i) to Eq. (ii)

$$\Rightarrow 4x = y + 8$$

$$\Rightarrow 4x = 3x - 3 + 8$$

$$\Rightarrow 4x - 3x = 5$$

$$\therefore x = 5$$

The numerator is 5

Substituting the value of x in Eq. (ii) to derive the value of y

$$\Rightarrow 4x = y + 8$$

$$\Rightarrow 4 \times 5 = y + 8$$

$$\Rightarrow 20 = y + 8$$

$$\Rightarrow y = 20 - 8$$

$$\therefore y = 12$$

The denominator is 12.

The fraction is $5/12$

Answer: the fraction is $5/12$

Rough work

Now checking the correctness of answer by subtracting 1 from the numerator

Fraction is $5/12$

$$(5-1)/12 = 4/12 = 1/3$$

Means answer is correct

Do your self

2. If 2 is subtracted from the numerator and 1 is added to the denominator, a fraction becomes $\frac{1}{2}$, but when 4 is added to the numerator and 3 is subtracted from the denominator it becomes $\frac{3}{2}$. What is the fraction?
3. A fraction becomes $\frac{2}{3}$ when 1 is added to both, its numerator and denominator. And, it becomes $\frac{1}{2}$ when 1 is subtracted from both the numerator and denominator. What is the fraction?
4. If we add 1 to the numerator and subtract 1 from the denominator, a fraction reduced is to 1, it becomes $\frac{1}{2}$ if we only add 1 to the denominator. What is the fraction?
5. A fraction becomes $\frac{1}{3}$ when 1 is subtracted from both the numerator and the denominator. The same fraction becomes $\frac{1}{2}$ when 1 is added to both numerator and the denominator the sum of numerator and denominator of the fraction is?