

**Q 1.** Express  $0.1\bar{3}$  as a rational number.

**Solution**

Given:  $0.1\bar{3} = 0.1333 \dots$

Let  $x = 0.1333 \dots$  (1)

Hence  $10x = 1.3333\dots$  (2)

(2) - (1) gives

$$10x - x = 1.3333 \dots - 0.1333 \dots$$

$$9x = 1.2$$

$$x = \frac{1.2}{9} = \frac{12}{90} = \frac{2}{15}$$

**Answer**

**Q 2.** Represent  $0.1232323 \dots$  as a rational number.

**Solution**

Let  $x = 0.1\bar{23} = 0.1232323 \dots$

$$\Rightarrow 1000x = 123.\overline{23} = 123.\overbrace{232323 \dots}^{Decimal_1}$$
 (1)

$$\Rightarrow 10x = 1.\overbrace{232323 \dots}^{Decimal_2}$$
 (2)

Note that when multiplying  $x$  by 10, 100, 1000 etc. the goal is to get

$Decimal_1 = Decimal_2$  in order to get the  $p$  as an integer in the rational form  $\frac{p}{q}$

(1) - (2)

$$\Rightarrow 990x = 123.232323 \dots - 1.232323 \dots$$

$$\Rightarrow 990x = 122$$

$$\Rightarrow x = \frac{122}{990}$$

**Answer**