

# Mathematics

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(Chapter – 1) (Number Systems)(Exemplar Problems)

(Class – IX)

## Exercise 1.3

### Question 12:

If  $a = 2 + \sqrt{3}$ , then find the value of  $a - \frac{1}{a}$ .

### Answer 12:

Given that  $a = 2 + \sqrt{3}$ , therefore, we have

$$\frac{1}{a} = \frac{1}{2 + \sqrt{3}}$$

$$\Rightarrow \frac{1}{a} = \frac{1}{2 + \sqrt{3}} \times \frac{2 - \sqrt{3}}{2 - \sqrt{3}}$$

$$\Rightarrow \frac{1}{a} = \frac{2 - \sqrt{3}}{2^2 - (\sqrt{3})^2}$$

$$\Rightarrow \frac{1}{a} = \frac{2 - \sqrt{3}}{4 - 3}$$

$$\Rightarrow \frac{1}{a} = 2 - \sqrt{3}$$

Now  $a - \frac{1}{a}$

$$= (2 + \sqrt{3}) + (2 - \sqrt{3})$$

$$= 4$$

