

EXERCISE 6.3

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Express the following numbers in the standard form:

(i) 3908.78

(ii) 5,00,00,000

(iii) 3,18,65,00,000

(iv) 846×10^7

(v) 723×10^9

Solution:

(i) Given 3908.78

$3908.78 = 3.90878 \times 10^3$ [since the decimal point is moved 3 places to the left]

(ii) Given 5,00,00,000

$5,00,00,000 = 5,00,00,000.00 = 5 \times 10^7$ [since the decimal point is moved 7 places to the left]

(iii) Given 3,18,65,00,000

$3,18,65,00,000 = 3,18,65,00,000.00$

$= 3.1865 \times 10^9$ [since the decimal point is moved 9 places to the left]

(iv) Given 846×10^7

$846 \times 10^7 = 8.46 \times 10^2 \times 10^7$ [since the decimal point is moved 2 places to the left]

$= 8.46 \times 10^9$ [since $a^m \times a^n = a^{m+n}$]

(v) Given 723×10^9

$723 \times 10^9 = 7.23 \times 10^2 \times 10^9$ [since the decimal point is moved 2 places to the left]

$= 7.23 \times 10^{11}$ [since $a^m \times a^n = a^{m+n}$]

2. Write the following numbers in the usual form:

(i) 4.83×10^7

(ii) 3.21×10^5

(iii) 3.5×10^3

Solution:

(i) Given 4.83×10^7

$4.83 \times 10^7 = 483 \times 10^{7-2}$ [since the decimal point is moved two places to the right]

$$= 483 \times 10^5$$
$$= 4, 83, 00,000$$

(ii) Given 3.21×10^5

$$3.21 \times 10^5 = 321 \times 10^{5-2} \text{ [since the decimal point is moved two places to the right]}$$
$$= 321 \times 10^3$$
$$= 3, 21,000$$

(iii) Given 3.5×10^3

$$3.5 \times 10^3 = 35 \times 10^{3-1} \text{ [since the decimal point is moved one place to the right]}$$
$$= 35 \times 10^2$$
$$= 3,500$$

3. Express the numbers appearing in the following statements in the standard form:

(i) The distance between the Earth and the Moon is 384,000,000 meters.

(ii) Diameter of the Earth is 1, 27, 56,000 meters.

(iii) Diameter of the Sun is 1,400,000,000 meters.

(iv) The universe is estimated to be about 12,000,000,000 years old.

Solution:

(i) Given the distance between the Earth and the Moon is 384,000,000 meters.
The distance between the Earth and the Moon is 3.84×10^8 meters.
[Since the decimal point is moved 8 places to the left.]

(ii) Given diameter of the Earth is 1, 27, 56,000 meters.
The diameter of the Earth is 1.2756×10^7 meters.
[Since the decimal point is moved 7 places to the left.]

(iii) Given diameter of the Sun is 1,400,000,000 meters.
The diameter of the Sun is 1.4×10^9 meters.
[Since the decimal point is moved 9 places to the left.]

(iv) Given the universe is estimated to be about 12,000,000,000 years old.
The universe is estimated to be about 1.2×10^{10} years old.
[Since the decimal point is moved 10 places to the left.]