

Unit 2 Logarithms

1. Express the following numbers in scientific notation:

(i) 2000000

$$2000000 = 2 \times 10^6$$

(ii) 48900

$$48900 = 4.98 \times 10^4$$

(iii) 0.0042

$$0.0042 = 4.2 \times 10^{-3}$$

(iv) 0.0000009

$$0.0000009 = 9 \times 10^{-7}$$

(v) 73×10^3

$$\begin{aligned} 73 \times 10^3 &= 7.3 \times 10^1 \times 10^3 \\ &= 7.3 \times 10^{1+3} \\ &= 7.3 \times 10^4 \end{aligned}$$

(vi) 0.65×10^2

$$\begin{aligned} 0.65 \times 10^2 &= 6.5 \times 10^{-1} \times 10^2 \\ &= 6.5 \times 10^{-1+2} \\ &= 6.5 \times 10^1 \end{aligned}$$

2. Express the following numbers in ordinary notation:

(i) 8.04×10^2

$$8.04 \times 10^2 = 804$$

(ii) 3×10^5

$$3 \times 10^5 = 300000$$

(iii) 1.5×10^{-2}

$$1.5 \times 10^{-2} = 0.015$$

(iv) 1.77×10^7

$$1.77 \times 10^7 = 17700000$$

(v) 5.5×10^{-6}

$$5.5 \times 10^{-6} = 0.0000055$$

(vi) 4×10^{-5}

$$4 \times 10^{-5} = 0.00004$$

3. The speed of light is approximately 3×10^8 meters per second. Express it in standard form.

$$\text{Speed of light} = 3 \times 10^8 \text{ ms}^{-1}$$

$$\text{In standard form} = 300000000 \text{ ms}^{-1}$$

4. The circumference of the Earth at the equator is about 4007500 meters. Express this number in scientific notation.

$$\text{Circumference of Earth} = 40075000 \text{ m}$$

$$\text{In scientific notation} = 4.0075 \times 10^7 \text{ m}$$

5. The diameter of Mars is $6.779 \times 10^3 \text{ km}$.

Express this number in standard form.

$$\text{Diameter of Mars} = 6.779 \times 10^3 \text{ km}$$

$$\text{In standard form} = 6779 \text{ km}$$

6. The diameter of Earth is about $1.2756 \times 10^4 \text{ km}$.

Express this number in standard form.

$$\text{Diameter of Earth} = 1.2756 \times 10^4 \text{ km}$$

$$\text{In standard form} = 12756 \text{ km}$$