

## CHAPTER 07

# Cubes and Cube Roots

### Prime Factorization Method:

In order to find the cube root of a perfect cube number by the following procedure.

#### Example:

Find the cube root of 216.

**Step (1):** First express the number as a product of its prime factors.

$$216 = 2 \times 2 \times 2 \times 3 \times 3 \times 3$$

**Step (2):** Then, group the equal factors together in triples.

$$216 = (2 \times 2 \times 2) \times (3 \times 3 \times 3)$$

$$\begin{array}{r|l} 2 & 216 \\ \hline \end{array}$$

$$\begin{array}{r|l} 2 & 108 \\ \hline \end{array}$$

$$\begin{array}{r|l} 2 & 54 \\ \hline \end{array}$$

$$\begin{array}{r|l} 3 & 27 \\ \hline \end{array}$$

$$\begin{array}{r|l} 3 & 9 \\ \hline \end{array}$$

$$\begin{array}{r|l} & 3 \\ \hline \end{array}$$

**Step (3):** Choose a factor from each triple and find their product. This product is the required cube root.

$$\therefore \sqrt[3]{216} = 2 \times 3 = 6$$