Cubes and Cubes Roots Ex 4.3 Q4

Answer :

(i)
Cube root using units digit:

Let us consider 343.
The unit digit is 3; therefore, the unit digit in the cube root of 343 is 7.
There is no number left after striking out the units, tens and hundreds digits of the given number; therefore, the cube root of 343 is 7.
Hence, $\sqrt[3]{343} = 7$

(ii)
Cube root using units digit:

Let us consider 2744.
The unit digit is 4; therefore, the unit digit in the cube root of 2744 is 4.
After striking out the units, tens and hundreds digits of the given number, we are left with 2.
Now, 1 is the largest number whose cube is less than or equal to 2.
Therefore, the tens digit of the cube root of 2744 is 1.
Hence, $\sqrt[3]{2744} = 14$

(iii)
Cube root using units digit:

Let us consider 4913.
The unit digit is 3; therefore, the unit digit in the cube root of 4913 is 7.
After striking out the units, tens and hundreds digits of the given number, we are left with 4.
Now, 1 is the largest number whose cube is less than or equal to 4.
Therefore, the tens digit of the cube root of 4913 is 1.
Hence, $\sqrt[3]{4913} = 17$

(iv)
Cube root using units digit:

Let us consider 1728.
The unit digit is 8; therefore, the unit digit in the cube root of 1728 is 2.
After striking out the units, tens and hundreds digits of the given number, we are left with 1.
Now, 1 is the largest number whose cube is less than or equal to 1.
Therefore, the tens digit of the cube root of 1728 is 1.
Hence, $\sqrt[3]{1728} = 12$

(v)
Cube root using units digit:

Let us consider 35937.
The unit digit is 7; therefore, the unit digit in the cube root of 35937 is 3.
After striking out the units, tens and hundreds digits of the given number, we are left with 35.

Now, 3 is the largest number whose cube is less than or equal to 35 ($3^3 < 35 < 4^3$).
Therefore, the tens digit of the cube root of 35937 is 3.
Hence, $\sqrt[3]{35937} = 33$

(vi)
Cube root using units digit:

Let us consider the number 17576.
The unit digit is 6; therefore, the unit digit in the cube root of 17576 is 6.
After striking out the units, tens and hundreds digits of the given number, we are left with 17.
Now, 2 is the largest number whose cube is less than or equal to 17 ($2^3 < 17 < 3^3$).
Therefore, the tens digit of the cube root of 17576 is 2.
Hence, $\sqrt[3]{17576} = 26$

(vii)
Cube root by factors:

On factorising 134217728 into prime factors, we get:
$134217728 = 2 \times 2$

On grouping the factors in triples of equal factors, we get:
$134217728 = \{2 \times 2 \times 2\} \times \{2 \times 2 \times 2\} \times \{2 \times 2 \times 2\} \times \{2 \times 2 \times 2\} \times \{2 \times 2 \times 2\} \times \{2 \times 2 \times 2\} \times \{2 \times 2 \times 2\} \times \{2 \times 2 \times 2\} \times \{2 \times 2 \times 2\}$

Now, taking one factor from each triple, we get:
$\sqrt[3]{134217728} = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 512$

(viii)
Cube root by factors:

On factorising 48228544 into prime factors, we get:
$48228544 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 7 \times 7 \times 7 \times 13 \times 13 \times 13$

On grouping the factors in triples of equal factors, we get:
$48228544 = \{2 \times 2 \times 2\} \times \{2 \times 2 \times 2\} \times \{7 \times 7 \times 7\} \times \{13 \times 13 \times 13\}$

Now, taking one factor from each triple, we get:
$\sqrt[3]{48228544} = 2 \times 2 \times 7 \times 13 = 364$

(ix)
Cube root by factors:

On factorising 74088000 into prime factors, we get:
$74088000 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 5 \times 5 \times 7 \times 7 \times 7$

On grouping the factors in triples of equal factors, we get:
$74088000 = \{2 \times 2 \times 2\} \times \{2 \times 2 \times 2\} \times \{3 \times 3 \times 3\} \times \{5 \times 5 \times 5\} \times \{7 \times 7 \times 7\}$

Now, taking one factor from each triple, we get:
$\sqrt[3]{74088000} = 2 \times 2 \times 3 \times 5 \times 7 = 420$

(x)
Cube root using units digit:

Let is consider 157464.
The unit digit is 4; therefore, the unit digit in the cube root of 157464 is 4.
After striking out the units, tens and hundreds digits of the given number, we are left with 157.
Now, 5 is the largest number whose cube is less than or equal to 157 ($5^3 < 157 < 6^3$).
Therefore, the tens digit of the cube root 157464 is 5.
Hence, $\sqrt[3]{157464} = 54$

(xi)
Cube root by factors:

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