EXERCISE 4.5

Making use of the cube root table, find the cube root of the following (correct to three decimal places):

1. 7

Solution:

As we know that 7 lies between 1 and 100 so by using cube root table we get,

$\sqrt[3]{7} = 1.913$

∴ the answer is 1.913

2. 70

Solution:

As we know that 70 lies between 1 and 100 so by using cube root table from column x We get,

$\sqrt[3]{70} = 4.121$

∴ the answer is 4.121

3. 700

Solution:

$700 = 70 \times 10$

By using cube root table 700 will be in the column $\sqrt[3]{10}$x against 70.

So we get,

$\sqrt[3]{700} = 8.879$

∴ the answer is 8.879

4. 7000

Solution:

$7000 = 70 \times 100$

$\sqrt[3]{7000} = \sqrt[3]{(7 \times 1000)} = \sqrt[3]{7} \times \sqrt[3]{1000}$

By using cube root table,

We get,

$\sqrt[3]{7} = 1.913$

$\sqrt[3]{1000} = 10$

$\sqrt[3]{7000} = \sqrt[3]{7} \times \sqrt[3]{1000}$

$= 1.913 \times 10$

$= 19.13$

∴ the answer is 19.13

5. 1100

Solution:

$1100 = 11 \times 100$

$\sqrt[3]{1100} = \sqrt[3]{(11 \times 100)} = \sqrt[3]{11} \times \sqrt[3]{100}$

By using cube root table,

We get,

$\sqrt[3]{11} = 2.224$

$\sqrt[3]{100} = 4.6642$

$\sqrt[3]{1100} = \sqrt[3]{11} \times \sqrt[3]{100}$

$= 2.224 \times 4.642$

$= 10.323$

∴ the answer is 10.323

6.780

Solution:

$780 = 78 \times 10$

By using cube root table 780 would be in column $\sqrt[3]{10x}$ against 78.

We get,

$\sqrt[3]{780} = 9.205$

7. 7800

Solution:

$7800 = 78 \times 100$

$\sqrt[3]{7800} = \sqrt[3]{(78 \times 100)} = \sqrt[3]{78} \times \sqrt[3]{100}$

By using cube root table,

We get,

$\sqrt[3]{78} = 4.273$

$\sqrt[3]{100} = 4.6642$

$\sqrt[3]{7800} = \sqrt[3]{78} \times \sqrt[3]{100}$

$= 4.273 \times 4.642$

$= 19.835$

∴ the answer is 19.835

8. 1346

Solution:

Let us find the factors by using factorisation method,

We get,

$1346 = 2 \times 673$

$\sqrt[3]{1346} = \sqrt[3]{(2 \times 676)} = \sqrt[3]{2} \times \sqrt[3]{673}$

Since, 670<673<680 = $\sqrt[3]{670} < \sqrt[3]{673} < \sqrt[3]{680}$
By using cube root table,
$\sqrt[3]{670} = 8.750$
$\sqrt[3]{680} = 8.794$
For the difference (680-670) which is 10.
So the difference in the values = 8.794 - 8.750 = 0.044
For the difference (673-670) which is 3.
So the difference in the values = (0.044/10) × 3 = 0.0132
$\sqrt[3]{673} = 8.750 + 0.013 = 8.763$
$\sqrt[3]{1346} = \sqrt[3]{2} \times \sqrt[3]{673}$
$= 1.260 \times 8.763$
$= 11.041$
∴ the answer is 11.041

9. 250
Solution:
250 = 25×100
By using cube root table 250 would be in column $\sqrt[3]{10x}$ against 25.
We get,
$\sqrt[3]{250} = 6.3$
∴ the answer is 6.3

10. 5112
Solution:
Let us find the factors by using factorisation method,
$\sqrt[3]{5112} = \sqrt[3]{2 \times 2 \times 2 \times 3 \times 3 \times 71}$
$= \sqrt[3]{2^3 \times 3^2 \times 71}$
$= 2 \times \sqrt[3]{3^2} \times \sqrt[3]{71}$
$= 2 \times \sqrt[3]{9} \times \sqrt[3]{71}$
From cube root table we get,
$\sqrt[3]{9} = 2.080$
$\sqrt[3]{71} = 4.141$
$\sqrt[3]{5112} = 2 \times \sqrt[3]{9} \times \sqrt[3]{71}$
$= 2 \times 2.080 \times 4.141$
$= 17.227$
∴ the answer is 17.227

11. 9800
Solution:

$\sqrt[3]{9800} = \sqrt[3]{98} \times \sqrt[3]{100}$
From cube root table we get,
$\sqrt[3]{98} = 4.610$
$\sqrt[3]{100} = 4.642$
$\sqrt[3]{9800} = \sqrt[3]{98} \times \sqrt[3]{100}$
$= 4.610 \times 4.642$
$= 21.40$
∴ the answer is 21.40

12. 732
Solution:
$\sqrt[3]{732}$
We know that value of $\sqrt[3]{732}$ will lie between $\sqrt[3]{730}$ and $\sqrt[3]{740}$
From cube root table we get,
$\sqrt[3]{730} = 9.004$
$\sqrt[3]{740} = 9.045$
By using unitary method,
Difference between the values (740 – 730 = 10)
So, the difference in cube root values will be = 9.05 – 9.004 = 0.041
Difference between the values (732 – 730 = 2)
So, the difference in cube root values will be = (0.041/10) ×2 = 0.008
$\sqrt[3]{732} = 9.004+0.008 = 9.012$
∴ the answer is 9.012

13. 7342
Solution:
$\sqrt[3]{7342}$
We know that value of $\sqrt[3]{7342}$ will lie between $\sqrt[3]{7300}$ and $\sqrt[3]{7400}$
From cube root table we get,
$\sqrt[3]{7300} = 19.39$
$\sqrt[3]{7400} = 19.48$
By using unitary method,
Difference between the values (7400 – 7300 = 100)
So, the difference in cube root values will be = 19.48 – 19.39 = 0.09
Difference between the values (7342 – 7300 = 42)
So, the difference in cube root values will be = (0.09/100) × 42 = 0.037
$\sqrt[3]{7342} = 19.39+0.037 = 19.427$
∴ the answer is 19.427

14. 133100

Solution:

$\sqrt[3]{133100} = \sqrt[3]{(1331 \times 100)}$

$= \sqrt[3]{1331} \times \sqrt[3]{100}$

$= \sqrt[3]{11^3} \times \sqrt[3]{100}$

$= 11 \times \sqrt[3]{100}$

From cube root table we get,

$\sqrt[3]{100} = 4.462$

$\sqrt[3]{133100} = 11 \times \sqrt[3]{100}$

$= 11 \times 4.462$

$= 51.062$

∴ the answer is 51.062

15. 37800

Solution:

$\sqrt[3]{37800}$

Firstly let us find the factors for 37800

$\sqrt[3]{37800} = \sqrt[3]{(2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 175)}$

$= \sqrt[3]{(2^3 \times 3^3 \times 175)}$

$= 6 \times \sqrt[3]{175}$

We know that value of $\sqrt[3]{175}$ will lie between $\sqrt[3]{170}$ and $\sqrt[3]{180}$

From cube root table we get,

$\sqrt[3]{170} = 5.540$

$\sqrt[3]{180} = 5.646$

By using unitary method,

Difference between the values (180 – 170 = 10)

So, the difference in cube root values will be = 5.646 – 5.540 = 0.106

Difference between the values (175 – 170 = 5)

So, the difference in cube root values will be = (0.106/10) × 5 = 0.053

$\sqrt[3]{175} = 5.540 + 0.053 = 5.593$

$\sqrt[3]{37800} = 6 \times \sqrt[3]{175}$

$= 6 \times 5.593$

$= 33.558$

∴ the answer is 33.558

16. 0.27

Solution:

$\sqrt[3]{0.27} = \sqrt[3]{(27/100)} = \sqrt[3]{27}/\sqrt[3]{100}$

From cube root table we get,

$\sqrt[3]{27} = 3$
$\sqrt[3]{100} = 4.642$
$\sqrt[3]{0.27} = \sqrt[3]{27}/\sqrt[3]{100}$
$= 3/4.642$
$= 0.646$
∴ the answer is 0.646

17. 8.6
Solution:
$\sqrt[3]{8.6} = \sqrt[3]{(86/10)} = \sqrt[3]{86}/\sqrt[3]{10}$
From cube root table we get,
$\sqrt[3]{86} = 4.414$
$\sqrt[3]{10} = 2.154$
$\sqrt[3]{8.6} = \sqrt[3]{86}/\sqrt[3]{10}$
$= 4.414/2.154$
$= 2.049$
∴ the answer is 2.049

18. 0.86
Solution:
$\sqrt[3]{0.86} = \sqrt[3]{(86/100)} = \sqrt[3]{86}/\sqrt[3]{100}$
From cube root table we get,
$\sqrt[3]{86} = 4.414$
$\sqrt[3]{100} = 4.642$
$\sqrt[3]{8.6} = \sqrt[3]{86}/\sqrt[3]{100}$
$= 4.414/4.642$
$= 0.9508$
∴ the answer is 0.951

19. 8.65
Solution:
$\sqrt[3]{8.65} = \sqrt[3]{(865/100)} = \sqrt[3]{865}/\sqrt[3]{100}$
We know that value of $\sqrt[3]{865}$ will lie between $\sqrt[3]{860}$ and $\sqrt[3]{870}$
From cube root table we get,
$\sqrt[3]{860} = 9.510$
$\sqrt[3]{870} = 9.546$
$\sqrt[3]{100} = 4.642$
By using unitary method,
Difference between the values (870 – 860 = 10)

So, the difference in cube root values will be = 9.546 – 9.510 = 0.036
Difference between the values (865 – 860 = 5)
So, the difference in cube root values will be = (0.036/10) × 5 = 0.018
$\sqrt[3]{865}$ = 9.510 + 0.018 = 9.528
$\sqrt[3]{8.65} = \sqrt[3]{865}/\sqrt[3]{100}$
= 9.528/4.642
= 2.0525
∴ the answer is 2.053

20. 7532
Solution:
$\sqrt[3]{7532}$
We know that value of $\sqrt[3]{7532}$ will lie between $\sqrt[3]{7500}$ and $\sqrt[3]{7600}$
From cube root table we get,
$\sqrt[3]{7500}$ = 19.57
$\sqrt[3]{7600}$ = 19.66
By using unitary method,
Difference between the values (7600 – 7500 = 100)
So, the difference in cube root values will be = 19.66 – 19.57 = 0.09
Difference between the values (7532 – 7500 = 32)
So, the difference in cube root values will be = (0.09/100) × 32 = 0.029
$\sqrt[3]{7532}$ = 19.57 + 0.029 = 19.599
∴ the answer is 19.599

21. 833
Solution:
$\sqrt[3]{833}$
We know that value of $\sqrt[3]{833}$ will lie between $\sqrt[3]{830}$ and $\sqrt[3]{840}$
From cube root table we get,
$\sqrt[3]{830}$ = 9.398
$\sqrt[3]{840}$ = 9.435
By using unitary method,
Difference between the values (840 – 830 = 10)
So, the difference in cube root values will be = 9.435 – 9.398 = 0.037
Difference between the values (833 – 830 = 3)
So, the difference in cube root values will be = (0.037/10) ×3 = 0.011
$\sqrt[3]{833}$ = 9.398+0.011 = 9.409
∴ the answer is 9.409

22. 34.2

Solution:

$\sqrt[3]{34.2} = \sqrt[3]{(342/10)} = \sqrt[3]{342}/\sqrt[3]{10}$

We know that value of $\sqrt[3]{342}$ will lie between $\sqrt[3]{340}$ and $\sqrt[3]{350}$

From cube root table we get,

$\sqrt[3]{340} = 6.980$

$\sqrt[3]{350} = 7.047$

$\sqrt[3]{10} = 2.154$

By using unitary method,

Difference between the values (350 – 340 = 10)

So, the difference in cube root values will be = 7.047 – 6.980 = 0.067

Difference between the values (342 – 340 = 2)

So, the difference in cube root values will be = (0.067/10) × 2 = 0.013

$\sqrt[3]{342} = 6.980 + 0.013 = 6.993$

$\sqrt[3]{34.2} = \sqrt[3]{342}/\sqrt[3]{10}$

$= 6.993/2.154$

$= 3.246$

∴ the answer is 3.246

23. What is the length of the side of a cube whose volume is 275 cm^3. Make use of the table for the cube root.

Solution:

The given volume of the cube = $275cm^3$

Let us consider the side of the cube as ‘a’cm

$a^3 = 275$

$a = \sqrt[3]{275}$

We know that value of $\sqrt[3]{275}$ will lie between $\sqrt[3]{270}$ and $\sqrt[3]{280}$

From cube root table we get,

$\sqrt[3]{270} = 6.463$

$\sqrt[3]{280} = 6.542$

By using unitary method,

Difference between the values (280 – 270 = 10)

So, the difference in cube root values will be = 6.542 – 6.463 = 0.079

Difference between the values (275 – 270 = 5)

So, the difference in cube root values will be = (0.079/10) × 5 = 0.0395

$\sqrt[3]{275} = 6.463 + 0.0395 = 6.5025$

∴ the answer is 6.503cm