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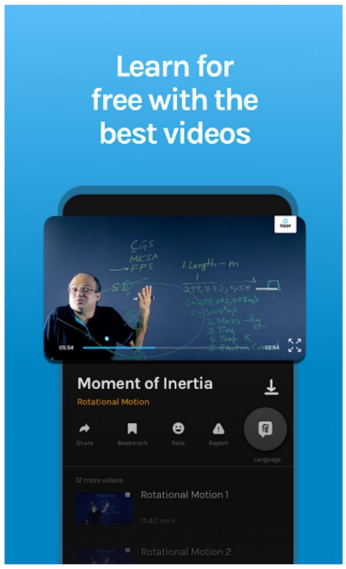


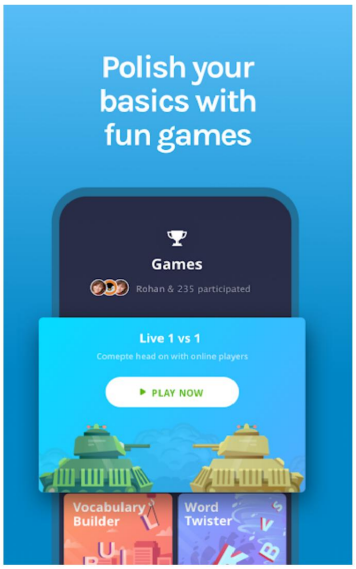


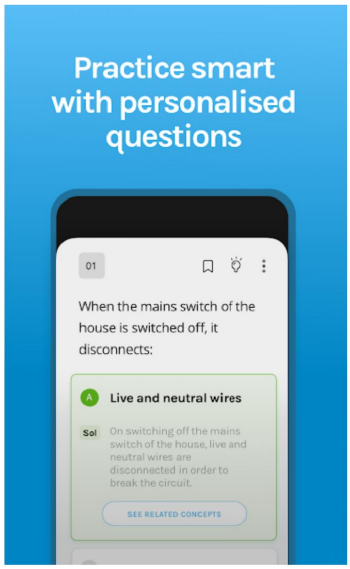


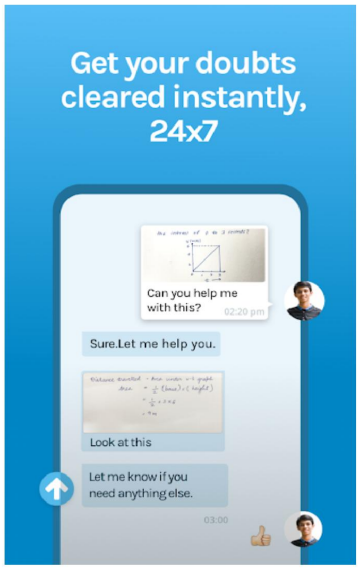


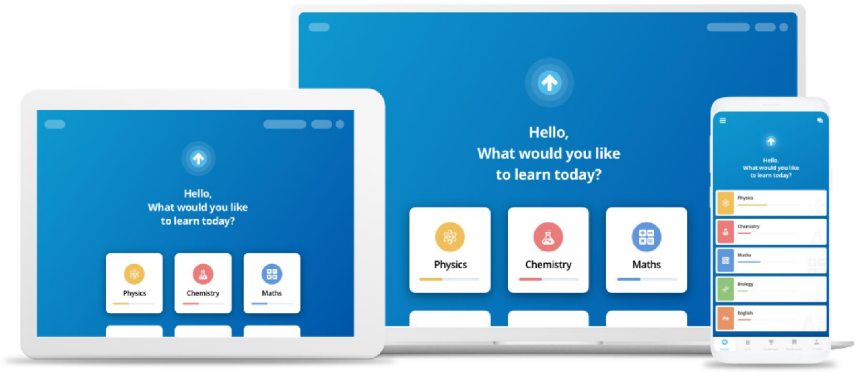


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**#427474**

**Topic:** Cubes and Patterns

**Passage**

Write the units digit of the cube for the following number:

71

**A** 1

**B** 2

**C** 5

**D** 3

**Solution**

$1 \times 1 \times 1 = 1$

So the units digit of the cube is also 1.

Ans- Option *A*.

**#427476**

**Topic:** Cubes and Patterns

**Passage**

Write the units digit of the cube for the following number:

109

**A** 1

**B** 7

**C** 9

**D** 3

**Solution**

$9 \times 9 \times 9 = 729$

So the units digit of the cube is also 9.

Ans- Option *C*.

**#427477**

**Topic:** Cubes and Patterns

**Passage**

Write the units digit of the cube for the following number:

388

**A** 4

**B** 3

**C** 2

**D** 8

**Solution**

8 × 8 × 8 = 512

So the units digit of the cube is also 2.

Ans- Option *C*.

---

**#427478**

**Topic:** Cubes and Patterns

**Passage**

Write the units digit of the cube for the following number:

833

**A** 3

**B** 7

**C** 1

**D** 9

**Solution**

3 × 3 × 3 = 27

So the units digit of the cube is also 7.

Ans- Option *B*.

---

**#427479**

**Topic:** Cubes and Patterns

**Passage**

Write the units digit of the cube for the following number:

4276

**A** 6

**B** 8

**C** 4

**D** none of these

**Solution**

6 × 6 × 6 = 216

So the units digit of the cube is also 6.

Ans- Option *A*.

---

**#427480**

**Topic:** Cubes and Patterns

**Passage**

Write the units digit of the cube for the following number:

5922

**A** 8

**B** 4

**C** 6

**D** none of these

**Solution**

2 × 2 × 2 = 8

So the units digit of the cube is also 8.

Ans- Option *A*.

---

**#427481**

**Topic:** Cubes and Patterns

**Passage**

Write the units digit of the cube for the following number:

77774

**A** 4

**B** 6

**C** 8

**D** none of these

**Solution**

4 × 4 × 4 = 64

So the units digit of the cube is also 4.

Ans- Option *A*.

---

**#427483**

**Topic:** Cubes and Patterns

**Passage**

Write the units digit of the cube for the following number:

44447

**A** 3

**B** 7

**C** 9

**D** 1

**Solution**

7 × 7 × 7 = 3

So the units digit of the cube is also 3.

Ans- Option *A*.

---

**#427484**

**Topic:** Cubes and Patterns

**Passage**

Write the units digit of the cube for the following number:

125125125

**A** 5

**B** 7

**C** 0

**D** none of these

**Solution**

$5 \times 5 \times 5 = 125$

So the units digit of the cube is also 5.

Ans- Option *A*.

---

**#427488**

**Topic:** Cubes and Patterns

$(35)^3 = ?$

**A** 42875

**B** 44875

**C** 43005

**D** None of these

**Solution**

$35 = 7 \times 5$

$\therefore \quad (35)^3 = (7)^3 \times (5)^3$

$= 7 \times 7 \times 7 \times 5 \times 5 \times 5$

$= 343 \times 125$

$= 42875$

$\therefore$ The cube of 35 = 42875.

---

**#427489**

**Topic:** Cubes and Patterns

$(56)^3 = ?$

**A** 175616

**B** 235616

**C** 175656

**D** None of these

**Solution**

$56 = 7 \times 8$

$\therefore \quad (56)^3 = (7)^3 \times (8)^3$

$= 7 \times 7 \times 7 \times 8 \times 8 \times 8$

$= 343 \times 512$

$= 175616$

$\therefore$ The cube of 56 = 175616.

---

**#427490**

**Topic:** Cubes and Patterns

$(72)^3 = ?$

**A** 373248

**B** 473258

**C** 383244

**D** None of these

**Solution**

$72 = 8 \times 9$

$\therefore \quad (72)^3 = (8)^3 \times (9)^3$

$= 8 \times 8 \times 8 \times 9 \times 9 \times 9$

$= 512 \times 729$

$= 373248$

$\therefore$ The cube of $72 = 373248$.

---

**#427491**

**Topic:** Cubes and Patterns

$(402)^3 = ?$

**A** 64964808

**B** 64964804

**C** 645064802

**D** None of these

**Solution**

$402 = 2 \times 3 \times 67$

$\therefore \quad (402)^3 = (2)^3 \times (3)^3 \times (67)^3$

$= 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 67 \times 67 \times 67$

$= 8 \times 27 \times 300763$

$= 64964808$

$\therefore$ The cube of $402 = 64964808$.

---

**#427501**

**Topic:** Cubes and Patterns

Find the smallest number by which $243$ must be multiplied, so that the product is a perfect cube.

**A** 6

**B** 3

**C** 7

**D** none of these

**Solution**

$243 = 3 \times 3 \times 3 \times 3 \times 3$

$= \left(3^3 \times 3^2\right) = (3)^3 \times 3^2$

In this factorization there is no triplet for $3$.

So, $243$ is not a perfect cube.

$\therefore$ $243$ has to be multiplied by $3$ to make it a perfect cube.

---

**#427502**

**Topic:** Cubes and Patterns

Find the smallest number by which 256 must be multiplied, so that the product is a perfect cube.

**A** 0

**B** 2

**C** 3

**D** 7

**Solution**

$256 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

$= \left(2^3 \times 2^3 \times 2^2\right)$

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

In this factorization there is no triplet for 2.

So, 256 is not a perfect cube.

$\therefore$ 256 has to be multiplied by 2 to make it a perfect cube.

---

**#427504**

**Topic:** Cubes and Patterns

Find the smallest number by which 72 must be multiplied, so that the product is a perfect cube.

**A** 3

**B** 6

**C** 12

**D** 4

**Solution**

$72 = 2 \times 2 \times 2 \times 3 \times 3$

$= \left(2^3 \times 3^2\right) = (2)^3 \times 3^2$

In this factorisation there is no triplet for 3.

So, 72 is not a perfect cube.

Therefore, 72 has to be multiplied by 3 to make it a perfect cube.

---

**#427510**

**Topic:** Cubes and Patterns

Find the smallest number by which 81 must be divided, so that the quotient is a perfect cube.

**A** 3

**B** 4

**C** 5

**D** 2

**Solution**

81 can be factorized as:

$81 = 3 \times 3 \times 3 \times 3$

$= \left(3^3 \times 3\right)$

$= (3)^3 \times 3$

In this factorization, there is no triplet for 3.

So, 81 is not a perfect cube.

81 must be divided by 3 to make the quotient a perfect cube.

---

**#427513**

**Topic:** Cubes and Patterns

Find the smallest number by which 128 must be divided, so that the quotient is a perfect cube.

**A** 2

**B** 3

**C** 7

**D** 12

**Solution**

$128 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

$= \left(2^3 \times 2^3 \times 2\right)$

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

In the above factorization there is no triplet for 2.

So, 128 is not a perfect cube.

Therefore, 128 must be divided by 2 to make the quotient a perfect cube.

---

**#427518**

**Topic:** Cubes and Patterns

Find the smallest number by which 135 must be divided, so that the quotient is a perfect cube.

**A** 3

**B** 5

**C** 9

**D** 15

**Solution**

$135 = 5 \times 3 \times 3 \times 3$

$= \left(5 \times 3^3\right)$

$= (3)^3 \times 5$

In the above factorization there is triplet for 5.

So, 135 is not a perfect cube.

$\therefore$ 135 must be divided by 5 to make the quotient a perfect cube.

---

**#427521**

**Topic:** Cubes and Patterns

Find the smallest number by which 192 must be divided, so that the quotient is a perfect cube.

**A** 2

**B** 3

**C** 4

**D** 7

**Solution**

By prime factorisation method, we have

$192 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3$

$= \left(2^3 \times 2^3 \times 3\right)$

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

In the above factorization there is no triplet for 3.

So, 192 is not a perfect cube.

Therefore, 192 must be divided by 3 to make the quotient a perfect cube.

---

**#427524**

**Topic:** Cubes and Patterns

If $n$ is even, then $n^3$ is also even. Enter 1 if statement is true or enter 0 is the statement is false.

**Answer:** 1

**Solution**

Let $n = 4$

$\therefore \quad n^3 = 4 \times 4 \times 4 = 64$

$\therefore$ if $n$ is even, $n^3$ is also even.

Hence proved.

---

**#427564**

**Topic:** Cubes and Patterns

No perfect cube can end with exactly:

**A** two zeros

**B** three zeros

**C** no zeros

**D** 7

**Solution**

A perfect cube of a number is obtained by multiplying the number by itself three times.

Eg: $1^3 = 1 * 1 * 1 = 12^3 = 2 * 2 * 2 = 83^3 = 3 * 3 * 3 = 27.....$

So, $10^3 = 10 \times 10 \times 10 = 1000$

So, perfect cubes can never end with one or two zeroes and have to end with exactly 3 zeroes.

---

**#427567**

**Topic:** Cubes and Patterns

There is no perfect cube which ends in:

**A** 5

**B** 4

**C** 0

**D** None of the above

**Solution**

$1^3 = 1$

$2^3 = 8$

$3^3 = 27$

$4^3 = 64$

$5^3 = 125$

$6^3 = 216$

$7^3 = 343$

$8^3 = 512$

$9^3 = 729$

$10^3 = 1000$

A number ending with 1, 2, 3, 4, 5, 6, 7, 8, 9, 0 has

perfect cubes ending with 1, 8, 7, 4, 5, 6, 3, 2, 9, 0 respectively.

Hence, option $D$ is correct.

---

**#427574**

**Topic:** Cubes and Patterns

For an integer $a$, choose the correct statement.

**A** $a^3$ is always greater than $a^2$.

**B** $a^3$ is always smaller than $a^2$.

**C** $a^2$ is always greater than $a^3$.

**D** None of the above

**Solution**

False, since the square of 1 is 1 is equal to the cube of 1. In this case $a^3$ is not greater than $a^2$.

---

**#427589**

**Topic:** Cubes and Patterns

If $a^2$ ends in 9, then $a^3$ will end in:

**A** 7

**B** 3

**C** 5

**D** none of the above

**Solution**

Suppose $a^2 = 9$

$\therefore a = 3$.

$\Rightarrow a^3 = 27$

Thus, $a^3$ end in 7.

---

**#427604**

**Topic:** Cubes and Patterns

Find the cube root 64 by successive subtraction of numbers:

(1, 7, 19, 37, 61, 91, 127, 169, 217, 271, 331, 397, . . . )

**A** 6

**B** 12

**C** 8

**D** 4

**Solution**

64 − 1 = 63, 63 − 7 = 56, 56 − 19 = 37, 37 − 37 = 0.

⇒ The remainder zero is got by 4 successive subtractions.

∴ The cube root of 64 = 4.

---

**#427628**

**Topic:** Cube Roots

**Passage**

Find the smallest number that must be subtracted from the given number which is not a perfect cube so as to make them perfect cubes.

130

**A** 6

**B** 5

**C** 4

**D** 3

**Solution**

130 − 1 = 129, 129 − 7 = 122, 122 − 19 = 103, 103 − 37 = 66, 66 − 61 = 5.

⇒ The remainder got is 5.

⇒ 5 is the number to be subtracted from 130 to make it a perfect cube.

⇒ 130 − 5 = 125 is the perfect cube.

∴ The corresponding cube $\sqrt[3]{125} = 5$.

---

**#427687**

**Topic:** Cube Roots

**Passage**

Find the smallest number that must be subtracted from the given number which is not a perfect cube so as to make them perfect cubes.

345

**A** 5

**B** 4

**C** 2

**D** 3

**Solution**

345 − 1 = 344, 344 − 7 = 337, 337 − 19 = 318, 318 − 37 = 281,

281 − 61 = 220, 220 − 91 = 129, 129 − 127 = 2.

The remainder got is not zero.

∴ 345 is not a perfect cube.

The remainder got is 2.

⇒ 2 is the number to be subtracted from 345 to make it a perfect cube.

⇒ 345 − 2 = 343 is the perfect cube.

---

**#427689**

**Topic:** Cube Roots

**Passage**

Find the smallest number that must be subtracted from the given number which is not a perfect cube so as to make them perfect cubes.

792

**A** 62

**B** 61

**C** 63

**D** 60

**Solution**

792 − 1 = 791, 791 − 7 = 784, 784 − 19 = 765, 765 − 37 = 728, 728 − 61 = 667,

667 − 91 = 576, 576 − 127 = 449, 449 − 169 = 280, 280 − 217 = 63

63 is the number to be subtracted from 792 to make it a perfect cube.

∴ 792 − 63 = 729 is the perfect cube.

∴ The corresponding cube root is $\sqrt[3]{729} = 9$..

---

**#427695**

**Topic:** Cubes and Patterns

**Passage**

Find the unit digit of the cube root of the following number:

226981

**A** 3

**B** 5

**C** 7

**D** 1

**Solution**

The unit's digit of 226981 is 1.

Since $(1)^3 = 1$, the unit's digit of the cube root of 226981 is 1.

---

**#427696**

**Topic:** Cubes and Patterns

**Passage**

Find the unit digit of the cube root of the following number:

13824

**A** 8

**B** 6

**C** 4

**D** 2

**Solution**

The unit's digit of 13824 is 4.

Since $(4)^3 = 64$, the unit's digit of the cube root of 13824 is 4.

---

**#427697**

**Topic:** Cubes and Patterns

**Passage**

Find the unit digit of the cube root of the following number:

571787

**A** 5

**B** 4

**C** 3

**D** 7

**Solution**

The unit's digit of 571787 is 7.

Since $(3)^3 = 27$, the unit's digit of the cube root of 571787 is 3.

---

**#427698**

**Topic:** Cubes and Patterns

**Passage**

Find the unit digit of the cube root of the following number:

175616

**A** 5

**B** 6

**C** 8

**D** 9

**Solution**

For 1756716, the unit digit is 6.

And the unit digit of cube root of 6 is 6

∴ The unit digit of the cube root of 175616 is 6.

---

**#427701**

**Topic:** Cube Roots

Find the cube root of 389017 by finding their units and ten digits:

**A** 63

**B** 67

**C** 73

**D** 77

**Solution**

389017

Here the unit digit is 7.

∴ The unit digit of its cube root is 3 .[ ∵ $3^3 = 27$]

After grouping the last three digits from the right, the number left is 389.

Now, $7^3 = 343 < 389$ and $8^3 = 512 > 389$.

∴ The tens digit of the cube root is 7.

∴ $\sqrt[3]{389017} = 73$

---

**#427707**

**Topic:** Cube Roots

Find the cube root of 250047 using prime factorization:

**A** 63

**B** 61

**C** 67

**D** 65

**Solution**

∴ $250047 = (3)^6 \times (7)^3$

∴ $\sqrt[3]{250047} = 3^2 \times 7 = 63$

---

**#427708**

**Topic:** Cube Roots

Find the cube root of 438976 using prime factorization:

**A** 74

**B** 72

**C** 76

**D** 71

**Solution**

$438976 = (2)^6 \times (19)^3$

$\sqrt[3]{438976} = 2^2 \times 19$

$= 2 \times 2 \times 19$

$= 76$

---

**#427709**

**Topic:** Cube Roots

Find the cube root of 592704 using prime factorization:

**A** 86

**B** 82

**C** 84

**D** 88

**Solution**

$592704 = (2)^6 \times (3)^3 \times (7)^3$

$\therefore \sqrt[3]{592704} = (2)^2 \times 3 \times 7$

$= 84$

---

**#427710**

**Topic:** Cube Roots

Find the cube root of $614125$ using prime factorization:

**A** 65

**B** 75

**C** 85

**D** 95

**Solution**

$614125$ can be factorized as:

$614125 = 5 \times 122825$

$= 5 \times 5 \times 24565$

$= 5 \times 5 \times 5 \times 4913$

$= 5 \times 5 \times 5 \times 17 \times 289$

$= 5 \times 5 \times 5 \times 17 \times 17 \times 17$

Taking cube root on both the sides, we get

$\sqrt[3]{614125} = \sqrt[3]{5 \times 5 \times 5 \times 17 \times 17 \times 17}$

$= 5 \times 17$

$= 85$

---

**#427713**

**Topic:** Cube Roots

$\sqrt[3]{-226981} = ?$

**A** $-51$

**B** $-61$

**C** $-67$

**D** $-57$

**Solution**

$-226981$

The unit's digit of $226981$ is $1$, so $1$ is the unit's digit of the cube root.

Strike out the three digits: units, tens and hundreds digit. The number left is $226$.

$6^3 = 216 < 226 < 343 = 7^3$

$\Rightarrow$ $6$ is the ten's digit of the cube root of $226981$.

$\therefore$ $-61$ is the cube root of $-226981$.

---

**#427715**

**Topic:** Cube Roots

$\sqrt[3]{-13824}$ = ?

**A** −24

**B** −28

**C** −26

**D** −34

**Solution**

−13824

The unit's digit of 13824 is 4, so 4 is the unit's digit of the cube root.

Grouping out the three digits from the right, the number left is 13.

$2^3 = 8 < 13 < 27 = 3^3$

$\Rightarrow$ 2 is the ten's digit of the cube root of 13824.

$\therefore$ −24 is the cube root of −13824.

---

**#427718**

**Topic:** Cube Roots

**Passage**

Find the cube root of :

-571787

**A** 0

**B**

**C**

**D**

**Solution**

-571787

The unit's digit of 571787 is 7, so 3 is the unit's digit of the cube root.

Strike out the three digits: units, tens and hundreds digit. The number left is 571.

$8^3 = 512 < 571 < 729 = 9^3$

$\Rightarrow$ 8 is the ten's digit of the cube root of 571787.

$\therefore$ -83 is the cube root of -571787.

---

**#427723**

**Topic:** Cube Roots

Find the cube root of: 175616

**A** 56

**B** 46

**C** 66

**D** 76

**Solution**

We need to find cube root of 175616

$= \sqrt{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 7 \times 7 \times 7}$

$= 2 \times 2 \times 2 \times 7$

$= 56$

---

**#427725**

**Topic:** Cubes and Patterns

Find the smallest number by which 3087 must be multiplied so that the product is a perfect cube.

**Answer:** 3

**Solution**

$3087 = (3)^2 \times (7)^3$

In this factorisation, we find there is no triplet for 3.

$\therefore$ 3087 does not have a cube root.

$\therefore$ The smallest number by which 3087 is to be multiplied so that the product has a cube root is 3.

---

**#427726**

**Topic:** Cubes and Patterns

Find the smallest number by which 33275 must be multiplied so that the product is a perfect cube.

**Answer:** 5

**Solution**

$3235 = (5)^2 \times (11)^3$

In this factorisation, we find there is no triplet for 5.

$\therefore$ 33275 does not have a cube root.

$\therefore$ The smallest number by which 33275 is to be multiplied so that the product has a cube root is 5.

---

**#427727**

**Topic:** Cubes and Patterns

Find the smallest number by which 2808 must be multiplied so that the product is a perfect cube.

**Answer:** 169

**Solution**

Let us first factorise 2808.

$2808 = \underline{2 \times 2 \times 2} \times \underline{3 \times 3 \times 3} \times 13$

Here, we can see that the factors 2 and 3 are in cubes and 13 is not.

Hence, we need to multiply by 13, twice, in order to make 2808 a perfect cube.

$13 \times 13 = 169$ is the correct answer.

---

**#427744**

**Topic:** Cubes and Patterns

Find $(7)^3 = ?$

**Answer:** 343

**Solution**

$(7)^3$

$= 7 \times 7 \times 7$

$= 343$

**#427745**

**Topic:** Cubes and Patterns

Find $(12)^3$ = ?

**Answer:** 1728

**Solution**

$(12)^3$

$= 12 \times 12 \times 12$

$= 1728$

**#427746**

**Topic:** Cubes and Patterns

$(21)^3$ = ?

**Answer:** 9621

**Solution**

$(21)^3 = 21 \times 21 \times 21$

$= 9621$

**#427747**

**Topic:** Cubes and Patterns

Find $(100)^3$ = ?

**Answer:** 1000000

**Solution**

$(100)^3$

$= 100 \times 100 \times 100$

$= 1000000$

**#427748**

**Topic:** Cubes and Patterns

$(302)^3$ = ?

**Answer:** 27543608

**Solution**

$(302)^3$

$= 302 \times 303 \times 302$

$= 27543608$

**#427763**

**Topic:** Cubes and Patterns

What is the smallest number by which 392 must be multiplied so that the product is a perfect cube?

**Answer:** 7

**Solution**

$392 = 2 \times 2 \times 2 \times 7 \times 7$

7 occurs as a prime factor only twice.

Hence, 7 is the smallest number by which 392 must be multiplied so that the product is a perfect cube.

**#427765**

**Topic:** Cubes and Patterns

What is the smallest number by which $8640$ must be divided so that the quotient is a perfect cube?

**Answer:** 5

**Solution**

$8640 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5$

$5$ occurs as a prime number only once.

Hence, $5$ is the smallest number by which $8640$ must be divided, so that the quotient is a perfect cube.

**#427767**

**Topic:** Cube Roots

Find the cube root of $343$.

**Answer:** 7

**Solution**

By prime factorisation method, we have

$343 = 7 \times 7 \times 7$

Taking cube root root on both sides, we get

$(343)^{1/3} = 7$

**#427768**

**Topic:** Cube Roots

Find the cube root of $8000$.

**Answer:** 20

**Solution**

$8000 = 2 \times 2 \times 2 \times 5 \times 5 \times 5 \times 2 \times 2 \times 2$

$\therefore \sqrt[3]{8000} = \sqrt[3]{\underline{2 \times 2 \times 2} \times \underline{2 \times 2 \times 2} \times \underline{5 \times 5 \times 5}} = 2 \times 2 \times 5 = 20$

**#427770**

**Topic:** Cube Roots

Find the cube root of $2744$.

**Answer:** 14

**Solution**

By prime factorisation method, we get

$2744 = 2 \times 2 \times 2 \times 7 \times 7 \times 7$

Taking cube root, we get

$\sqrt[3]{2744} = \sqrt[3]{2 \times 2 \times 2 \times 7 \times 7 \times 7}$

$= 2 \times 7 = 14$

**#427771**

**Topic:** Cube Roots

Find the cube root of $74088$.

**Answer:** 42

**Solution**

$74088 = 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 7 \times 7 \times 7$

$\therefore \sqrt[3]{74088} = \sqrt[3]{\underline{2 \times 2 \times 2} \times \underline{3 \times 3 \times 3} \times \underline{7 \times 7 \times 7}} = 2 \times 3 \times 7 = 42$

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**#427772**

**Topic:** Cube Roots

Find the cube root of $125$.

**Answer:** 5

**Solution**

We need to find cube root of $125 = \sqrt{5 \times 5 \times 5} = 5$.

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**#427775**

**Topic:** Cubes and Patterns

Multiply $137592$ by the smallest number so that the product is a perfect cube.

**Answer:** 1183

**Solution**

$137592 = 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 7 \times 7 \times 13$

The number $7$ and $13$ should be multiplied once and twice respectively so that the product is a perfect cube.

$\therefore$ The smallest number by which $137592$ must be multiplied

$= 7 \times 13 \times 13 = 1183$

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**#427776**

**Topic:** Cubes and Patterns

Divide the number $26244$ by the smallest number so that the quotient is a perfect cube.

**Answer:** 36

**Solution**

$26244 = 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 2 \times 2$

$2 \times 2 \times 3 \times 3 = 36$ is the smallest number by which $26244$ must be divided so that the quotient is a perfect cube.

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**#464885**

**Topic:** Cube Roots

Find cube root of the following numbers by prime factorisation method.

(i) 64

(ii) 512

(iii) 10648

(iv) 27000

(v) 15625

(vi) 13824

(vii) 110592

(viii) 46656

(ix) 175616

(x) 91125

**Solution**

(i) $64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 2^3 \times 2^3 = 4^3$

$\sqrt[3]{64} = 4$

(ii) $512 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

$= 2^3 \times 2^3 \times 2^3 = 8^3$

$\sqrt[3]{512} = 8$

(iii) $10648 = 2^3 \times 11^3 = 22^3$

$\sqrt[3]{10648} = 22$

(iv) $27000 = 2^3 \times 3^3 \times 5^3 = 30^3$

$\sqrt[3]{27000} = 30$

(v) $15625 = 5^3 \times 5^3 = 25^3$

$\sqrt[3]{15625} = 25$

(vi) $13824 = 2^3 \times 2^3 \times 2^3 \times 3^3 = 24^3$

$\sqrt[3]{13824} = 24$

(vii) $110592 = 2^3 \times 2^3 \times 2^3 \times 2^3 \times 3^3 = 48^3$

$\sqrt[3]{110592} = 48$

(viii) $46656 = 2^3 \times 2^3 \times 3^3 \times 3^3 = 36^3$

$\sqrt[3]{46656} = 36$

(ix) $175616 = 2^3 \times 2^3 \times 2^3 \times 7^3 = 56^3$

$\sqrt[3]{175616} = 56$

(x) $91125 = 5^3 \times 3^3 \times 3^3 = 45^3$

$\sqrt[3]{91125} = 45$

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**#464909**

**Topic:** Cubes and Patterns

State true or false.

(i) Cube of any odd number is even.

(ii) A perfect cube does not end with two zeros.

(iii) If square of a number ends with 5, then its cube ends with 25.

(iv) There is no perfect cube which ends with 8.

(v) The cube of a two digit number may be a three digit number.

(vi) The cube of a two digit number may have seven or more digits.

(vii) The cube of a single digit number may be a single digit number.

**Solution**

(i) Cube of any odd number is even.

**FALSE:** Odd multiplied by odd is always odd

(ii) A perfect cube does not end with two zeros.

**TRUE:** A perfect cube will end with odd number of zeroes

(iii) If square of a number ends with 5, then its cube ends with 25.

**TRUE:** 5 multiplied by 5 any number of times always gives 5 at units place

(iv) There is no perfect cube which ends with 8.

**False:** $2^3 = 8$

(v) The cube of a two digit number may be a three digit number.

**FALSE:** The smallest two digit number is 10 and $10^3 = 1000$ is a three digit number

(vi) The cube of a two digit number may have seven or more digits.

**FALSE:** 99 is the largest 2 digit number; $99^3 = 989901$ is a 6 digit number

(vii) The cube of a single digit number may be a single digit number.

**TRUE:** $2^3 = 8$ is a single digit number.

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**#464910**

**Topic:** Cube Roots

You are told that 1331 is a perfect cube. Can you guess without factorisation what is its cube root? Similarly, guess the cube root of 4913, 12167, 32768.

**Solution**

The given number is 1331.

Let us form groups of three digits starting from rightmost digit.

Therefore, the two groups are $\underline{1}$ and $\underline{331}$.

Consider the group : 331

We take the unit's place of required cube root as 1

Consider the group : 1

The unit's place of 1 is 1 itself. So, we take 1 as ten's place of cube root of 1331 as 1.

Thus, $\sqrt[3]{1331} = 11$.

Similarly,

$4913 \Rightarrow \underline{4}$ and $\underline{913}$

$\therefore \sqrt[3]{4913} = 17$

$12167 \Rightarrow \underline{12}$ and $\underline{167}$

$\therefore \sqrt[3]{12167} = 23$

$32768 \Rightarrow \underline{32}$ and $\underline{768}$

$\therefore \sqrt[3]{32768} = 32$

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**#464911**

**Topic:** Cubes and Patterns

Which of the following are not perfect cubes?

(i) 216

(ii) 128

(iii) 1000

(iv) 100

(v) 46656

**Solution**

(i) $216 = 2 \times 2 \times 2 \times 3 \times 3 \times 3 = 2^3 \times 3^3 = 6^3$

So, 216 is a perfect cube.

(ii) $128 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

$= 2^3 \times 2^3 \times 2 = 6^3 \times 2$

So, 128 is not a perfect cube.

(iii) $1000 = 2 \times 2 \times 2 \times 5 \times 5 \times 5 = 10^3$

So, 1000 is a perfect cube.

(iv) $100 = 2 \times 2 \times 5 \times 5 = 10^2$

So, 100 is not a perfect cube

(v) $46656 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 = 36^3$

So, 46656 is a perfect cube.

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**#464912**

**Topic:** Cubes and Patterns

Find the smallest no. by which of the following no. must be multiplied to obtain a perfect cube.

(i) 243

(ii) 256

(iii) 72

(iv) 675

(v) 100

**Solution**

(i) $243 = 3 \times 3 \times 3 \times 3 \times 3 = 3^3 \times 3 \times 3$

Required no $= 3$

(ii) $256 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 2^3 \times 2^3 \times 2 \times 2$

Required no. $= 2$

(iii) $72 = 2 \times 2 \times 2 \times 3 \times 3 = 2^3 \times 3 \times 3$

Required no. $= 3$

(iv) $675 = 5 \times 5 \times 3 \times 3 \times 3 = 3^3 \times 5 \times 5$

Required no. $= 5$

(v) $100 = 2 \times 2 \times 5 \times 5$

Required no. $= 2 \times 5 = 10$

**#464913**

**Topic:** Cubes and Patterns

Find the smallest no. by which each of the following no. must be divided to obtain a perfect cube.

(i) 81

(ii) 128

(iii) 135

(iv) 192

(v) 704

**Solution**

(i) $81 = 3 \times 3 \times 3 \times 3 = 3^3 \times 3$

Rquired no. $= 3$

(ii) $128 = 2^3 \times 2^3 \times 2$

Required no. $= 2$

(iii) $135 = 3^3 \times 5$

Required no. $= 5$

(iv) $192 = 2^3 \times 2^3 \times 3$

Required no. $= 3$

(v) $704 = 2^3 \times 2^3 \times 11$

Required no. $= 11$