#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

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

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

#427772

Topic: Cube Roots

Find the cube root of 125.

Answer: 5

Solution

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

#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

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

#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.

#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) $91125 = 5^3 \times 3^3 \times 3^3 = 45^3$

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

#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.

#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 $\underline{768}$

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

#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.

#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. $= 11$