

Answer the questions

- (1) If a cube has a surface area of 6936 m^2 , then what is the volume of the cube?
- (2) If you subtract a number x from 17 times that number, and then take the cube of the difference, what will be the result?
- (3) If the surface areas of two cubes are in the ratio 1:4, and the volume of the first cube is 512 m^3 , then what is the volume of the second cube?
- (4) What is the value of $\sqrt[3]{3.375}$?
- (5) There are two numbers such that sum of the numbers is 28 and their difference is 4. Find the difference of their cubes.
- (6) Find the value of A if $\sqrt[3]{500 \cdot A} = 10$
- (7) Solve the following:
 $\sqrt[3]{27} + \sqrt[3]{125}$
- (8) If you add a number x with another number that is 21 times the value of x , and then take the cube of the sum, what will be the result?

Choose correct answer(s) from given choice

- (9) What is the value of 39^3
 - a. 59280
 - b. 1521
 - c. 60840
 - d. 59319
- (10) Some bananas are packed into a box in stacks. Each stack has the same number of bananas in each row as the number of rows. The number of stacks is also the same as the number of rows. If there are 58 stacks of bananas in the box, what is the total number of bananas in the box?
 - a. 196687
 - b. 194817
 - c. 195112
 - d. 195437
- (11) A number n is called a perfect cube if there exists:
 - a. a natural number m such that $n = m \times m$
 - b. a natural number m such that $m = n \times m \times n$
 - c. a natural number m such that $n = m \times m \times m$
 - d. a natural number m such that $m = n + n + n$

(12) What is the value of $\sqrt[3]{\frac{-56}{875}}$.

a. $\frac{-7}{2}$

b. $\frac{-7}{5}$

c. $\frac{-2}{5}$

d. $\frac{-2}{7}$

Fill in the blanks

(13) A cubical box has all sides of 26 m. Its volume will be m³

(14) If you have a container in the shape of a cube that has a volume of 68921 m³, then the area of each of the faces of the cube is m².

(15) If the volume of a cube is 27000 m³, then surface area of the cube is m²



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Answers

(1) 39304 m^3

Step 1

We need to find the volume of the cube. The volume of a cube with side a is a^3 . This means if we can find the value of a , we can easily find the value of the volume of the cube.

Step 2

Let us find the value of the side a of the cube. We have been told that the surface area of the cube is 6936 m^2 . Let us use this fact to write an equation and find the value of a .

Step 3

The surface area of the cube with side $a = 6a^2$.

The given surface area of the cube = 6936 m^2 .

This means, $6936 = 6a^2$

$$\Rightarrow a^2 = \frac{6936}{6}$$

$$\Rightarrow a^2 = 1156$$

$$\Rightarrow a = \sqrt{1156}$$

$$\Rightarrow a = 34$$

Step 4

Now that we know that the value of the side of the cube is 34, let us find the volume of the cube, which is = a^3

$$= (34)^3$$

$$= 39304 \text{ m}^3$$

Step 5

Therefore, the volume of the cube is **39304 m^3** .

(2) $4096x^3$

Step 1

According to the question,
the first number is x and
the second number is $17x$.

Step 2

Difference of the numbers = $(17x - x)$

Step 3

Cube of the difference = $(17x - x)^3$

$$= (16x)^3$$

$$= 4096x^3$$

Step 4

Therefore, the result will be $4096x^3$.

(3) 4096 m^3 **Step 1**

Let us assume the side of the first cube is **a** .

Let us assume the side of the second cube is **b**.

Surface area of first cube = $6a^2$

Surface area of second cube = $6b^2$

Ratio of surface area of two cubes = 1:4

Step 2

Volume of first cube, $a^3 = 512 \text{ m}^3$

$$\Rightarrow a^3 = 8^3$$

$$\Rightarrow a = 8$$

Step 3

Now the ratio of surface area of cubes,

$$\frac{6a^2}{6b^2} = \frac{1}{4}$$

$$\Rightarrow \frac{8^2}{b^2} = \frac{1}{4}$$

$$\Rightarrow 64 \times 4 = 1 \times b^2$$

$$\Rightarrow \frac{256}{1} = b^2$$

$$\Rightarrow 256 = b^2$$

$$\Rightarrow 16^2 = b^2$$

$$\Rightarrow b = 16$$

Step 4

Volume of second cube, $b^3 = (16)^3$

$$= 16 \times 16 \times 16$$

$$= 4096$$

Step 5

Therefore, the volume of the second cube is **4096 m^3** .

(4) 1.5**Step 1**

Let $x = \sqrt[3]{3.375}$

Step 2

Multiply both left and right hand side by 10,

$$10x = 10 \times \sqrt[3]{3.375}$$

$$\Rightarrow 10x = \sqrt[3]{3.375 \times 1000}$$

$$\Rightarrow 10x = \sqrt[3]{3375}$$

Step 3

Now find the cube root of 3375

$$\Rightarrow 10x = \sqrt[3]{3375} = 15$$

$$\Rightarrow x = 15/10$$

$$\Rightarrow x = 1.5$$

Step 4

Therefore, the value of $\sqrt[3]{3.375}$ is **1.5**.

(5) 2368

Step 1

Let us assume that x and y are the two numbers.

Step 2

According to the question, the sum of two numbers is 28, that is,

$$x + y = 28 \quad \text{..... (1)}$$

Step 3

And the difference of two numbers is 4, that is,

$$x - y = 4 \quad \text{..... (2)}$$

Step 4

On adding equations (1) and (2),

$$x + y + x - y = 28 + 4$$

$$\Rightarrow 2x = 32$$

$$\Rightarrow x = 16$$

Step 5

Now using equation (1),

$$x + y = 28$$

$$\Rightarrow 16 + y = 28$$

$$\Rightarrow y = 28 - 16 = 12$$

Step 6

Now, difference of their cubes = $x^3 - y^3$

$$= (16)^3 - (12)^3$$

$$= 2368$$

Step 7

Therefore, the value of the difference of their cubes is **2368**.

(6) 2

Step 1

We have been asked to find the value of A from the following equation,

$$\sqrt[3]{(500A)} = 10.$$

Step 2

$$\sqrt[3]{(500A)} = 10$$

Taking cube both side,

$$\Rightarrow (\sqrt[3]{(500A)})^3 = (10)^3$$

$$\Rightarrow 500A = 10 \times 10 \times 10$$

$$\Rightarrow A = \frac{5 \times 5 \times 5 \times 2 \times 2 \times 2}{500}$$

$$\Rightarrow A = \frac{5 \times 5 \times 5 \times 2 \times 2 \times 2}{5 \times 5 \times 5 \times 2 \times 2}$$

$$\Rightarrow A = \frac{\cancel{5 \times 5 \times 5} \times \cancel{2 \times 2} \times 2}{\cancel{5 \times 5 \times 5} \times \cancel{2 \times 2}}$$

$$\Rightarrow A = 2$$

Step 3

Therefore, the value of A is **2**.

(7) 8

Step 1

Let's first find prime factors of 27 and 125

$$27 = 3 \times 3 \times 3 = 3^3$$

$$125 = 5 \times 5 \times 5 = 5^3$$

Step 2

Now,

$$\sqrt[3]{27} + \sqrt[3]{125}$$

$$= \sqrt[3]{(3^3)} + \sqrt[3]{(5^3)}$$

$$= 3 + 5$$

$$= 8$$

Step 3

Therefore, the value of $\sqrt[3]{27} + \sqrt[3]{125}$ is **8**.

(8) $10648x^3$ **Step 1**

According to the question,
the first number is x and the second number is $21x$.

Step 2

Sum of the two numbers = $(x + 21x)$

Step 3

Cube of the sum = $(x + 21x)^3$
 $= (22x)^3$
 $= 10648x^3$

Step 4

Therefore, the result will be $10648x^3$.

(9) d. 59319

Step 1

According to the question, we have to find the value of 39^3 .

Step 2

Now,
 $39^3 = 39 \times 39 \times 39$
 $= 1521 \times 39$
 $= 59319$

Step 3

Therefore, the value of 39^3 is **59319**.

(10) c. 195112

Step 1

It is given that the total number of stack in the box is 58.
 Total number of rows in one stack = 58
 number of columns in the stack equal to the number of rows = 58

Step 2

Total number of bananas in the box = Total number of stack $\times$ Total number of rows in one stack $\times$ Total number of column on one stack
 $= 58 \times 58 \times 58$
 $= 195112$.

Step 3

Therefore, the total number of bananas in the box are **195112**.

(11) c. a natural number m such that $n = m \times m \times m$

Step 1

A perfect cube is a natural number that has a natural number as its cube root.
In other words, a perfect cube is the result of multiplying a natural number three times by itself.

For example: $5 \times 5 \times 5 = 5^3 = 125$, which is a perfect cube.

Step 2

For any natural number m , $n = m \times m \times m$ is a perfect cube.

Step 3

Therefore, the number n is called a perfect cube if there exists a natural number m such that $n = m \times m \times m$.

(12) c. $\frac{-2}{5}$

Step 1

Let's first find prime factors of 56,
 $56 = 2 \times 2 \times 2 \times 7$

Step 2

Similarly prime factors of 875,
 $875 = 7 \times 5 \times 5 \times 5$

Step 3

Now,

$$\begin{aligned} & \sqrt[3]{\frac{-56}{875}} \\ &= \sqrt[3]{\frac{-1 \times 2 \times 2 \times 2 \times 7}{7 \times 5 \times 5 \times 5}} \\ &= -1 \sqrt[3]{\frac{2^3}{5^3}} \\ &= \frac{-2}{5} \end{aligned}$$

(13) 17576

Step 1

We know that the volume of a cube (or a cubical box) is calculated by taking the cube of its side.

Step 2

We have been told that the side of the cube in question is 26 m. Therefore, its volume =

$$(26)^3 \text{ m}^3$$

$$= 26 \times 26 \times 26 \text{ m}^3$$

$$= 17576 \text{ m}^3$$

Step 3

Therefore, the volume of the cubical box is **17576 m³**.

(14) 1681

Step 1

Let us assume the side of a cube shape container is **a**.

Step 2

$$\text{Volume of cube} = 68921 \text{ m}^3$$

$$\text{also, volume of the cube} = a^3$$

$$\text{compare both, } a^3 = 68921$$

$$\Rightarrow a = (68921)^{\frac{1}{3}}$$

$$\Rightarrow a = 41$$

Step 3

$$\text{Area of side of the cube} = a^2$$

$$= 41^2$$

$$= 1681$$

Step 4

Therefore, the area of the face of cube shape container is **1681 m²**.

(15) 5400

Step 1

We know that the volume of a cube with side $a = a^3$

The given volume of the cube = 27000 m^3

Let us write these two facts as an equation and find the value of a :

$$a^3 = 27000 \text{ m}^3$$

$$\Rightarrow a^3 = 30^3 \text{ m}^3$$

$$\Rightarrow a = 30 \text{ m}$$

Step 2

Now we know that side of the cube, $a = 30 \text{ m}$. Let us find the surface area which is equal to $6a^2$:

$$\text{Surface area} = 6a^2$$

$$= 6(30)^2$$

$$= 6(900)$$

$$= 5400 \text{ m}^2$$

Step 3

Therefore, the surface area of the cube is **5400 m^2** .