Cube and Cuboid - Solved Examples

Q 1 − A cube is segmented into 125 cubes. Before dividing the cube, each face of it is varnished with different colours. How many tiny cubes will be formed having more than one colour?

A - 44

B - 32

C - 45

D - 53

Answer - A

Explanation

x = Cube root of 125 = 5. More than one colour means two or more colours. So, total number of cubes whose two faces are varnished = (x - 2) × number of edges = (5 - 2) × 12 = 36. The three varnished cubes have the number of corners = 8. So total number of required cubes = 36 + 8 = 44. Hence option A is the answer.

Q 2 − A cube whose each corner is named as A, B, C, D, E, F, G and H is segmented into 27 equal tiny cubes. Before dividing the cube, each face of it is varnished with different colours. How many tiny cubes will be formed having more than one colour?

A - 64

B - 20

C - 55

D - 53

Answer - B

Explanation

x = Cube root of 27 = 3. More than one colour means two or more colours. So total number of cubes whose two faces are varnished = (x - 2) × number of edges = (3 - 2) × 12 = 12. The three varnished cubes have the number of corners = 8. So total number of required cubes = 12 + 8 = 20. Hence option B is the answer.

Q 3 − A cube is segmented into 216 equal tiny cubes. Before dividing the cube, each face of it is varnished with different colours. How many tiny cubes will be formed having more than one colour?

A - 78

B - 32

C - 45

D - 56

Answer - D

Explanation

x = Cube root of 216 = 6. More than one colour means two or more colours. So total number of cubes whose two faces are varnished is = (x - 2) × number of edges = (6 - 2) × 12 = 48. The three varnished cubes have the number of corners = 8. So total number of required cubes = 48 + 8 = 56. Hence option D is the answer.

Q 4 − Two adjacent portions of a big cube are varnished in green and other two portions are varnished in white and the rest of the two portions are varnished in blue. The cube is segmented into 125 tiny and equal cubes.

How many tiny cubes will be formed having all the three colours?

A - 7

B - 9

C - 10

D - 8

Answer - D

Explanation

The number of corners is 8 hence answer for tiny cubes which have all the three colours are related to 8 corners. Hence option D is correct.

Q 5 − How many tiny cubes will be formed having one portion white and one portion green for sure?

A - 18

B - 20

C - 16

D - 24

Answer - B

Explanation

Green and white varnished faces are joined by 4 edges, so number of cubes having green and white varnished faces = (x - 2) × number of edges = (5 - 2) × 4 = 3 × 4 = 12. Here X = Cube root of 125 = 5. Number of cubes having three faces varnished will also have green and white colours = 8. So total cubes = 12 + 8 = 20.

Q 6 − Two adjacent portions of a big cube are varnished in black and other two portions are varnished in maroon and the rest of the two portions are varnished in pink. The cube is segmented into 27 tiny and equal cubes.

How many tiny cubes will be formed having all the three colours?

A - 7

B - 9

C - 10

D - 8

Answer - D

Explanation

The number of corners is 8 hence answer for tiny cubes which have all the three colours are related to 8 corners. Hence option D.

Q 7 − How many tiny cubes will be formed having one portion maroon and one portion black for sure?

A - 12

B - 20

C - 16

D - 24

Answer - A

Explanation

Black and yellow varnished faces are joined by 4 edges, so number of cubes having black and yellow varnished faces = (3 - 2) × no. of edges = (3 - 2) × 4 = 1 × 4 = 4. Here X = Cube root of 27 = 3. Number of cubes having three faces varnished will also have black and yellow colours = 8. So total cubes = 4 + 8 = 12.

Q 8 − A big cube is having 12 cm portion and the tiny cubes cut out of it is having 4 cm of each portion. Then how many tiny cubes will be formed such that each face of these cubes is surrounded by other cubes?

A - 1

B - 2

C - 3

D - 4

Answer - A

Explanation

Here x = 12/4 = 3. Such cubes can be found by following method. X – 2 = 3 - 2 = 1 and 1 × 1 × 1 = 1. So number of cubes will be formed such that each face of these cubes is surrounded by other cubes is only one.

Q 9 − A big cube is having 24 cm each portion. Tiny cubes of 6 cm portion each is cut from that. Then how many tiny cubes will be formed that are surrounded by at least one cube?

A - 8

B - 19

C - 17

D - 32

Answer - A

Explanation

Here x = 24/6 = 4 cm. So x - 2 = 4 - 2 = 2. Finally: 2 × 2 × 2 = 8. Hence answer is option A.

Q 10 − A big cube is having 20 cm portion and the tiny cubes cut out of it is having 4 cm of each portion. Then how many tiny cubes will be formed such that each face of these cubes is surrounded by other cubes?

A - 26

B - 25

C - 27

D - 40

Answer - C

Explanation

Here x = 20/4 = 5. Such cubes can be found by following method. X – 2 = 5 -2 = 3 and 3 × 3 × 3 = 27. So number of cubes will be formed such that each face of these cubes is surrounded by other cubes is 27.