

St-2

CUBE & CUBOID

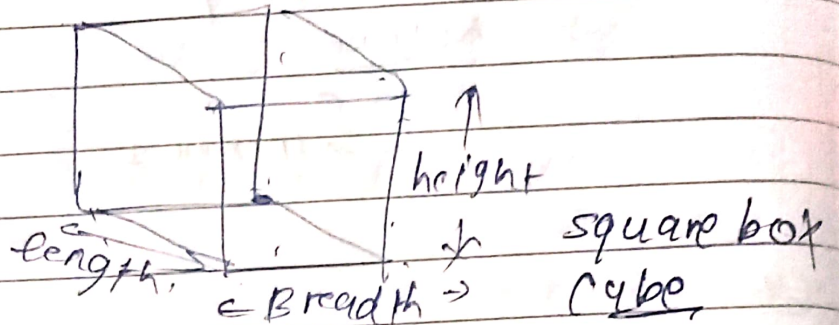
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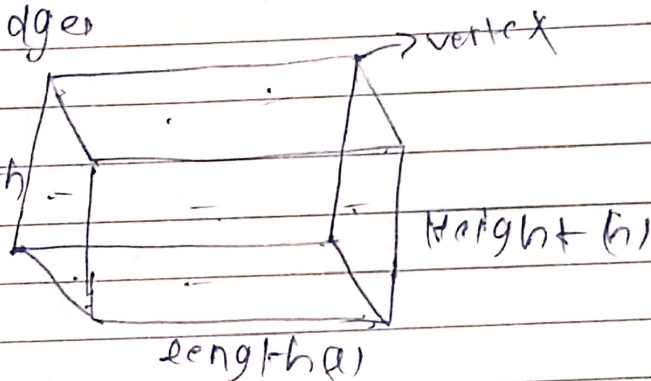
a) cube : A cube has three sides. ²⁵₁₂₅ 6
length, breadth & height, where all side equals.

- ✓ Vertices = 8
- ✓ Edges = 12
- ✓ One face = A^2
- ✓ CSA = $4A^2$
- ✓ TSA = $6A^2$
- ✓ Volume = A^3



b) Cuboid :- A cuboid is 3-dimensional structure. with three side where all sides are not equal. length, height & width. A cuboid has 6 faces, 8 vertices & 12 edges.

$$\begin{aligned} \text{TSA} &= 2(lb + bh + lh) \\ \text{LSA} &= 2(l + b)h \\ \text{length} &= 4(l + b + h) \end{aligned}$$



- 6 faces
- 8 vertices & 12 edges.

Formula of cube: For cube side $n \times n \times n$ of dimension $1 \times 1 \times 1$.

- No. of cube with 0 side painted = $(n-2)^3$
- No. of cubes with 1 side = $6(n-2)^2$
- No. of cubes with 2 side = $12(n-2)$
- No. of cubes with 3 sides = 8 (always)

$$6(3-2)^2$$

* Formula of cuboid :- formula of cuboid of dimension $a \times b \times c$ painted. cut into dimension $1 \times 1 \times 1$.

→ No. of cubes with 0 side painted = $(a-2)(b-2)(c-2)$

→ No. of cubes with 1 side painted = $2[(a-2)(b-2) + (b-2)(c-2) + (a-2)(c-2)]$

→ No. of cubes with 2 sides painted = $4(a+b+c-6)$

→ No. of cubes with 3 sides painted = 8 (always)

~~Q1~~

* Cuboid :- cube

total small cube = n^3

$$n = \frac{\text{Big cube side}}{\text{small cube side}} = \frac{A}{a}$$

$$\frac{16}{2 \times 2} = 2$$

Q1 Q1 Total no. of small cube = $n^3 = 2^3 = 8$

Q2 Q2 Total no. of small cube on three surface colored = 8 (always)

Q3 Q3 Two surface colored = $12(n-2)$
 $= 12(2-2)$
 $= 12 \times 0 = 0$

Q4 Q4 At least two surface painted = 0 surface + 1 surface

$$\begin{aligned} \text{2 surface + 1 surface} &= (n-2)^3 + 6(n-2)^2 \\ &= (2-2)^3 + 6(2-2)^2 \\ &= 0 + 6 \times 0 \\ &= 0 \end{aligned}$$

12
18
60

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Q5 Single surface coloured $= 6(n-2)^2$
 $= 6(4-2)^2$
 $= 6 \times 4 = 24$

Q6 Colourless $= (n-2)^3$
 $= (4-2)^3 = 2^3 = 8$

Q7 At least 1 surface $= 2 \text{ face} + 3 \text{ face} + 1 \text{ face}$
 $= 12(n-2) + 8 + 6(n-2)^2$
 $= 12(4-2) + 8 + 6(4-2)^2$
 $= 24 + 8 + 24$
 $= 56$

Q8 $x = \frac{\text{Big}}{\text{Small}} \text{ cube}$
 $= \frac{9}{3} = 3$
 $\therefore x = 3$

$\therefore \text{No. of small cubes} = x^3 = 3^3 = 27$

Q9 3 surface $= 8$

Q10 2 surface $= 12(n-2) = 12(3-2) = 12 \times 1$

Q11 At least 2 surface $= 2 \text{ face} + 3 \text{ face}$
 $= (n-2)^3 + 6(n-2)^2$
 $= (3-2)^3 + 6(3-2)^2$
 $= 1 + 6 = 7$
 $= 2 \text{ face} + 3 \text{ face}$
 $= 12(x-2) + 8$
 $= 12(3-2) + 8$
 $= 12 + 8 = 20 \text{ ans}$

$$\frac{n^3}{3} \quad \text{or} \quad \frac{n^3}{3}$$

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→ Big cube

Q12 \pm side color = $6(n-2)^2$ (corners = $9/3 \rightarrow$ small)
 $= 6(3-2)^2$
 $= 6$

Q13 an
 At least 1 surface colour :- 1 face + 2 face + 3 face
 $= 6(n-2)^2 + 12(n-2) + 8$
 $= 6 \times 1^2 + 12 \times 1 + 8$
 $= 26$

Q15 - 21 same

Q22 Three surface = 8

Q23 $\sqrt[3]{x} = 216$
 $x = 6$

\therefore Colours = $\frac{(n-2)^3}{(n-2)^3}$
 $= 4^3 = 64$

Q25 Formula.

No. of cubes = $3(n-1)$
 $= 3(6-1)$
 $= 3 \times 5$
 $= 15$

$\therefore x^3 = 216$
 $x = 6$

Q27 T.S.A = $6A^2$
 $A^2 = \frac{1536}{6} = 256$
 $\therefore A = 16$

$q^2 = 4$
 $q = 2$

$$x = \frac{16}{2} = 8$$

$$\rightarrow \text{No. of small cube} = x^3 = 8^3 = 512$$

Q28 One surface = A^2
 $= 16 \times 16 = 256 \text{ cm}$

Q29
 $T.SA = 6A^2$
 $= 6 \times 4$
 $= 24 \text{ cm}^2$

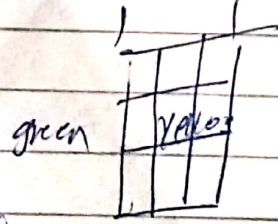
Q30 length of one side of large cube =
 $T.SA = 6A^2 = 1536$
 $A = 16 \text{ cm}$

Q31 cube = $3(x-1)$
 $= 3(8-1)$
 $= 3 \times 7 = 21$

Q32 Three surface colored = 8 (always)

Q33 Two surface = $\frac{12(n-2)}{3} \rightarrow \text{Formula 19}$
 $= \frac{12(3-2)}{3}$
 $= 4$

Q34



green value green = 4
 main oil
 $\rightarrow 2 \text{ line \& 3 line same cube}$
 $3 \times 4 = 12$

CHAPTER

CUBE & CUBOID

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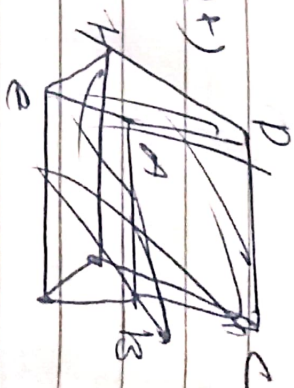
Lesson #1 Introduction

→ Cuboid is surrounded by 6 rectangular planes (faces or sides)

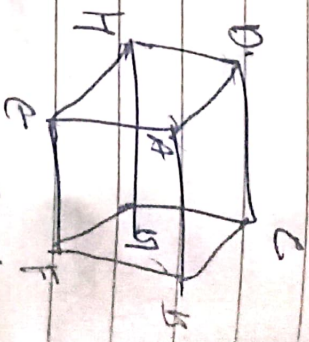
• Adjacent plane :- Adjacent means neighbouring.

→ $ABCD \neq ADHE$ (adjacent)

→ $ABCD + CBGF$ "



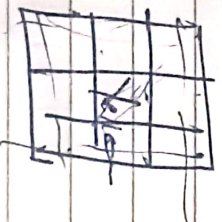
→ 12 edges in a cuboid.



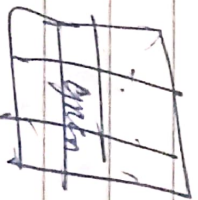
cuboid (rectangle box)

~~Q33~~
~~Q34~~
~~Q35~~
~~Q36~~
~~Q37~~
~~Q38~~
~~Q39~~
~~Q40~~
~~Q41~~
~~Q42~~
~~Q43~~
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Q35 Q12



Q36



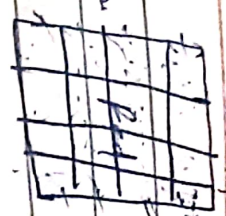
$$= 9 + 9 = 18$$

Q37, Q38

Q39

~~848 = 16~~

Yellow



Yellow

480 = 16

Q40

2482 = 8

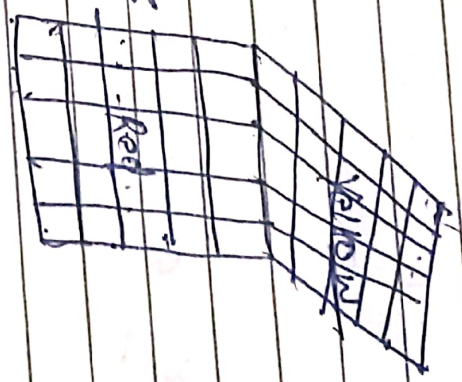


Q42

2 = 5

total face colour = $6(n-2)^2$
 $= 6 \times (5-2)^2$

$= 6 \times \frac{3}{2} \times 2$
 $= 12$



Q43

1

take side

corner edges

$\frac{1}{2} \times 4 = 20$



Q44

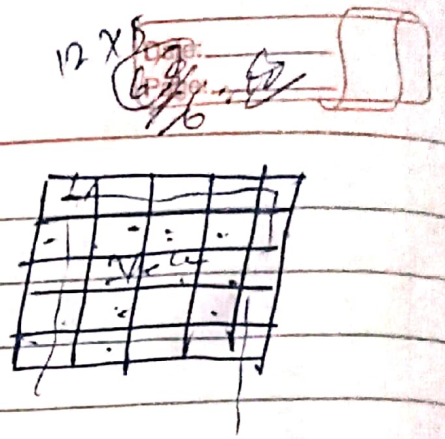
$(n-2) \times 3 = (5-2) \times 3 = 3 \times 3 = 9$

One side not covered = $6(n-2)^2$

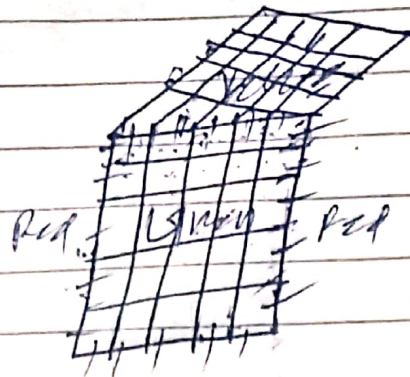
$= 6(5-2)^2$
 $= 6 \times 3^2$

$= 54$ ans

ans $c = \underline{18}$ $g + g = \underline{18}$



496



$\therefore (n-2)^3$
 $(5-2)^3 = 27$

c) ~~20~~ ~~19~~ = 5 * 8 : 4 + 0

$$\Rightarrow 5 \times 5 = 25$$

$$25 + 25 = 50$$

427 49

Q 49
Two side color = $6(n-2)^2$ | top + color
= $6(7-2)^2 + 8$

Two side color = $12(n-2) / 12 \times 5 = 60$

Q 50

At least two surface coloured:

$$12 = 2 \text{ face} + 3 \text{ face}$$

$$\Rightarrow 12(n-2) + 8$$

$$\Rightarrow 12 \times (7-2) + 8$$

$$= 68 \text{ mm}$$

