GATE-2023 CRASH COURSE

GENERAL APTITUDE

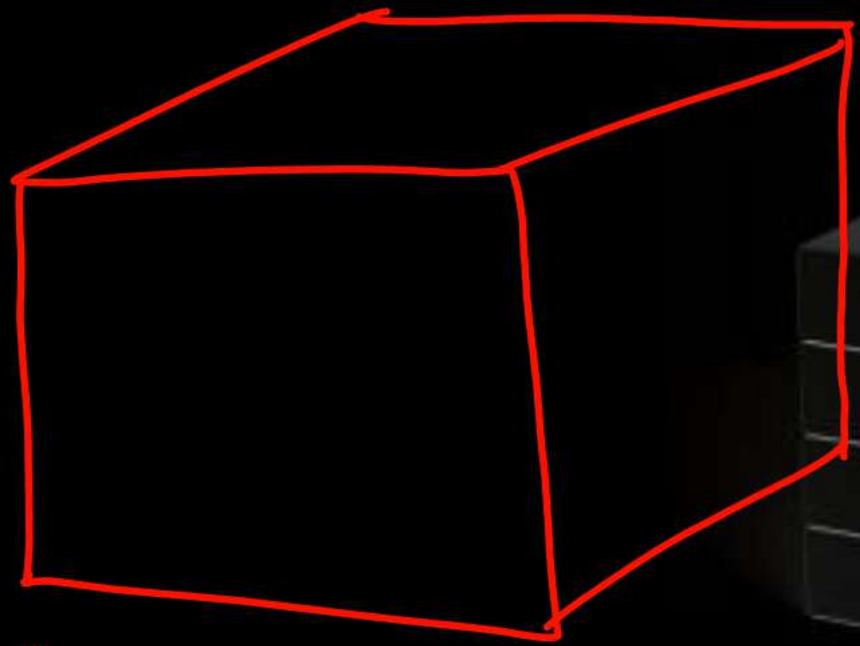
CUBES

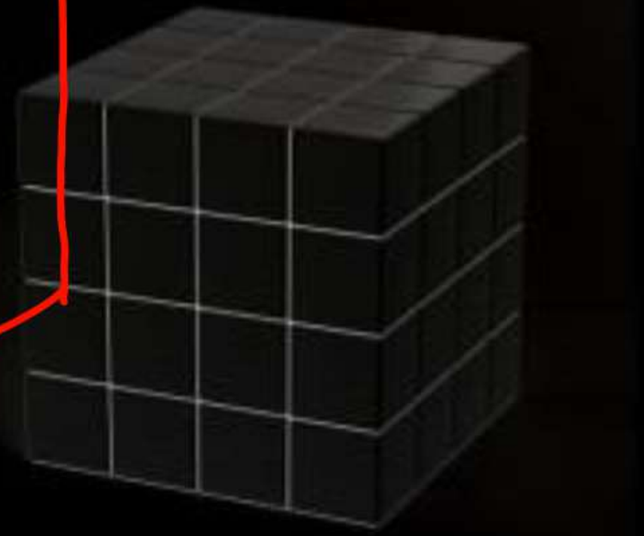
faces

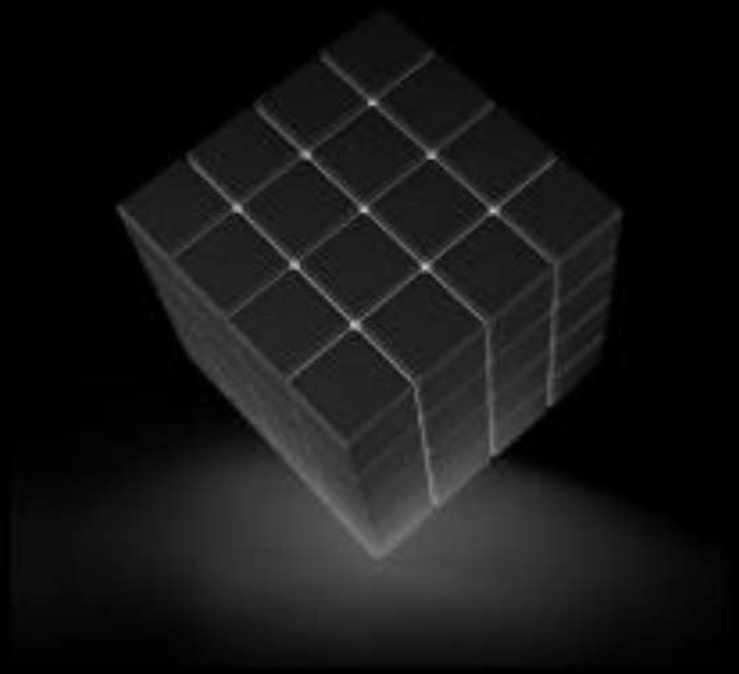
AMULYA RATAN SIR

Lecture no-09

CUBES



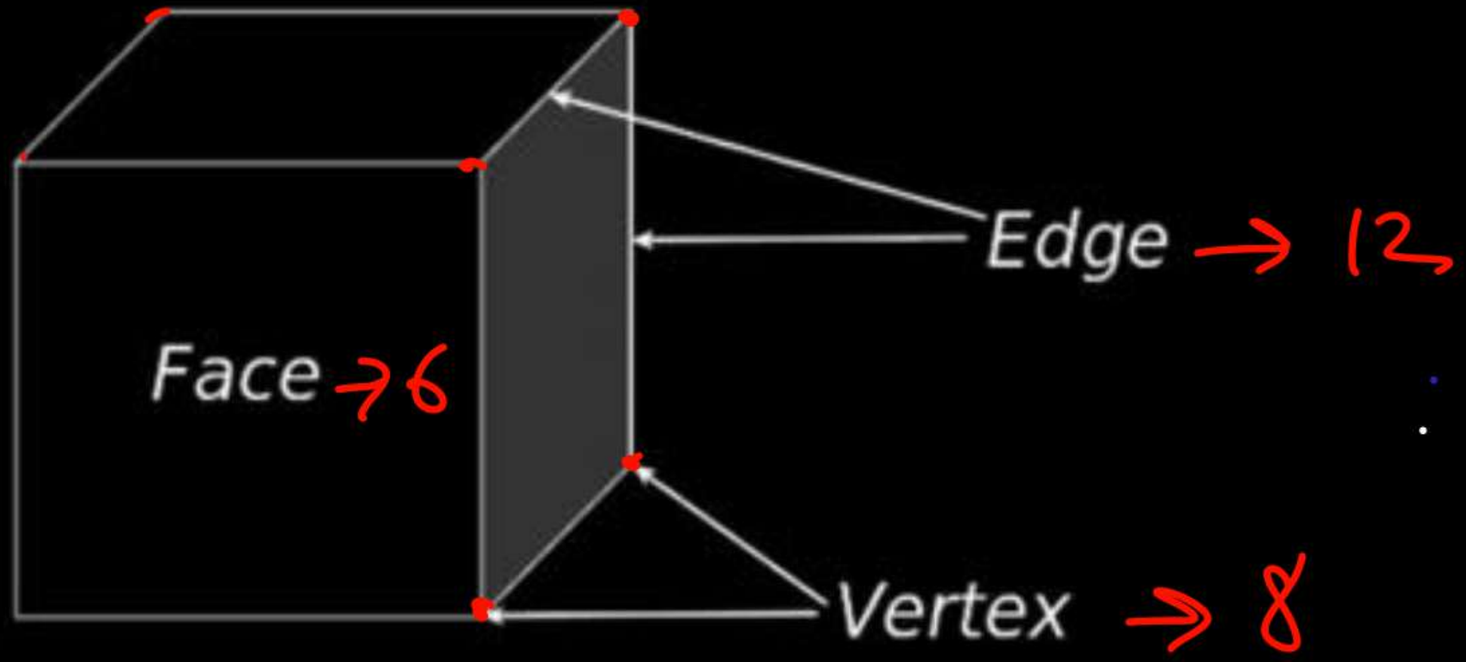


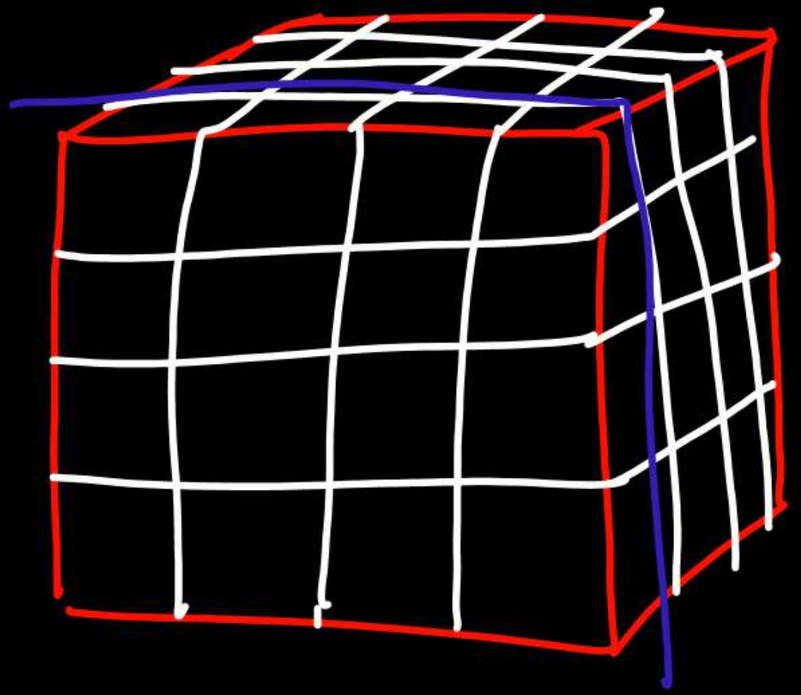


Vertex - 8

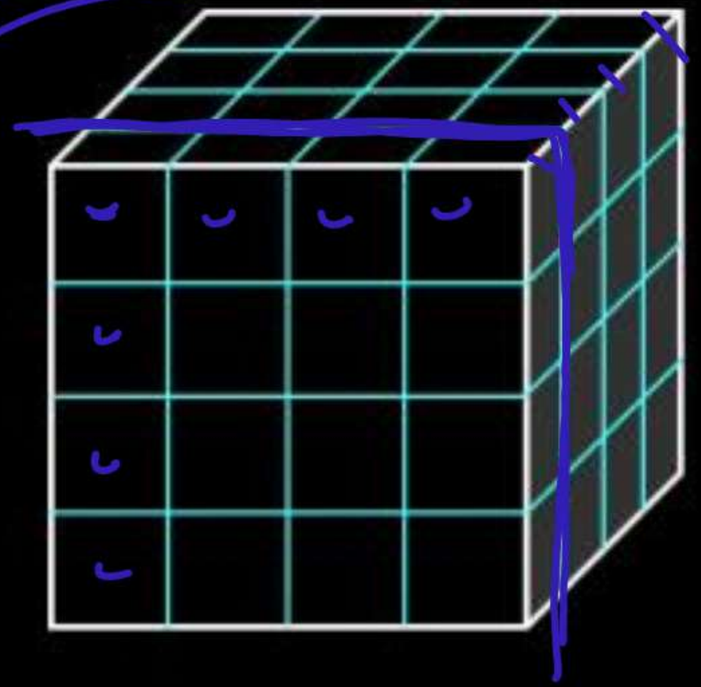
faces → 6

Edges → 12


Face → 6
Edge → 12
Vertex → 8

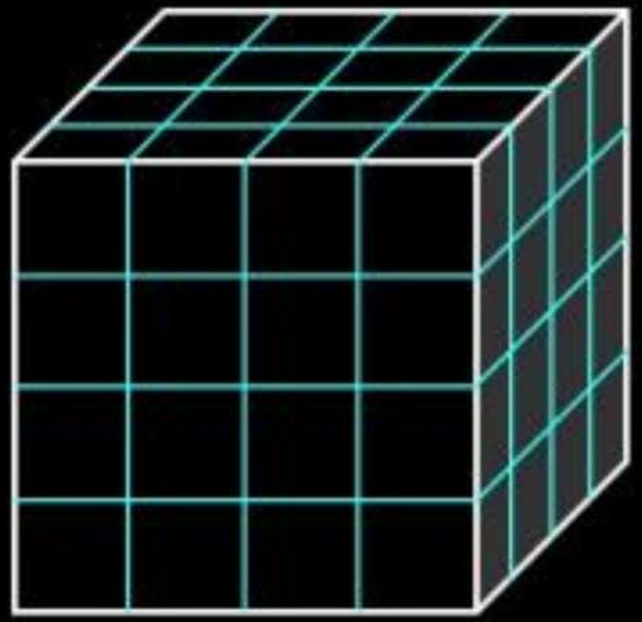


$16 \times 4 = 64$



'x' cut

'8' cuts

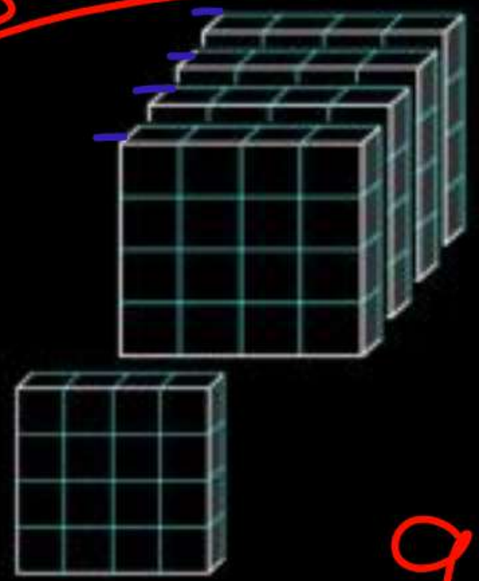


No. of cubes

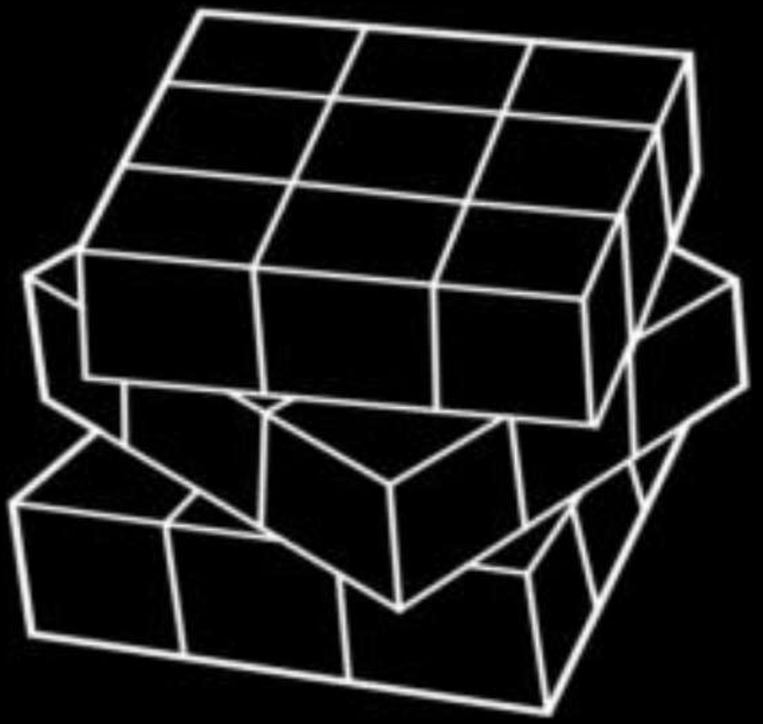
$= (x+1)^3$

$= 4^3 = 64$

7



9 cuts



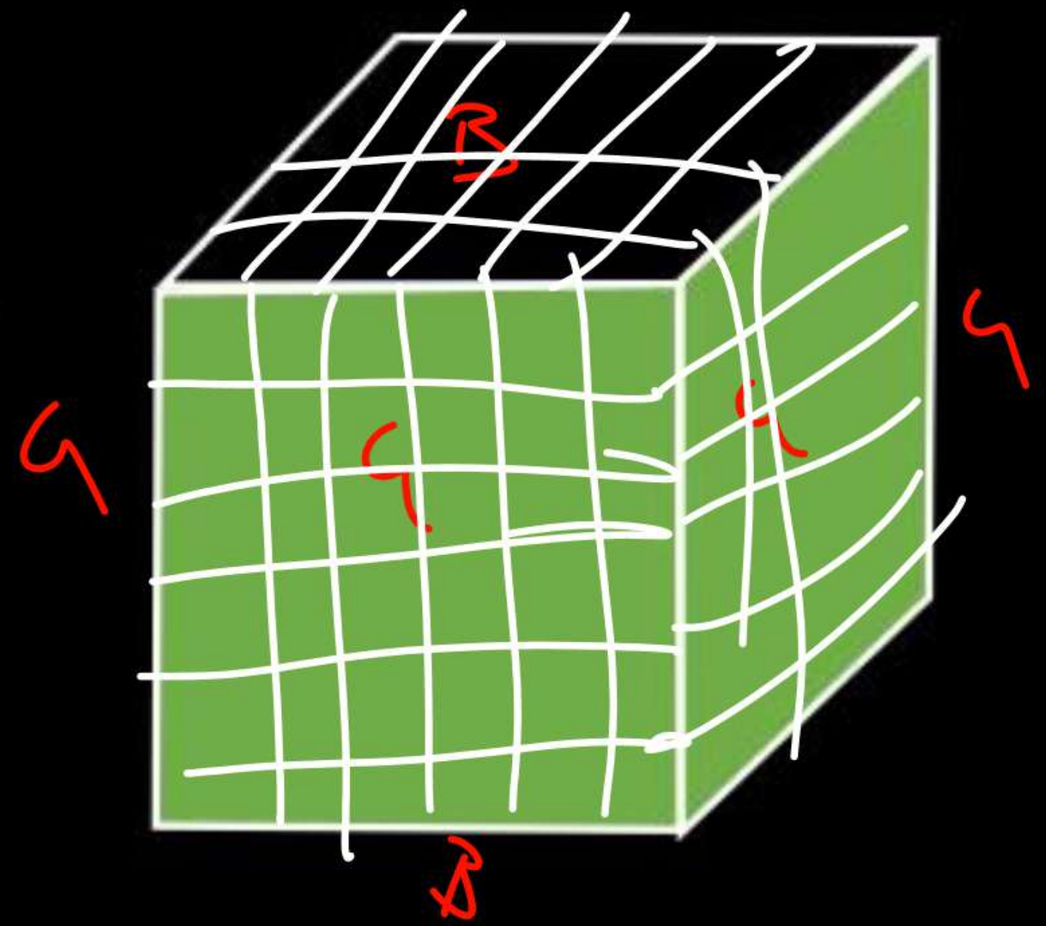
Q.

A Cube was painted on one of the opposite pair faces as black & remaining four faces as green. five cuts were given on each edges to form smaller Cubes of equal size.

1. How many cubes will be formed?
2. How many cubes will have no face painted at all?
3. How many cubes will have only one face painted?
4. How many cubes will have only two face painted, but with same colour?
5. How many cubes will have only two face painted, but different colour?
6. How many cubes will have atleast two face painted?
7. How many cubes will have three face painted?

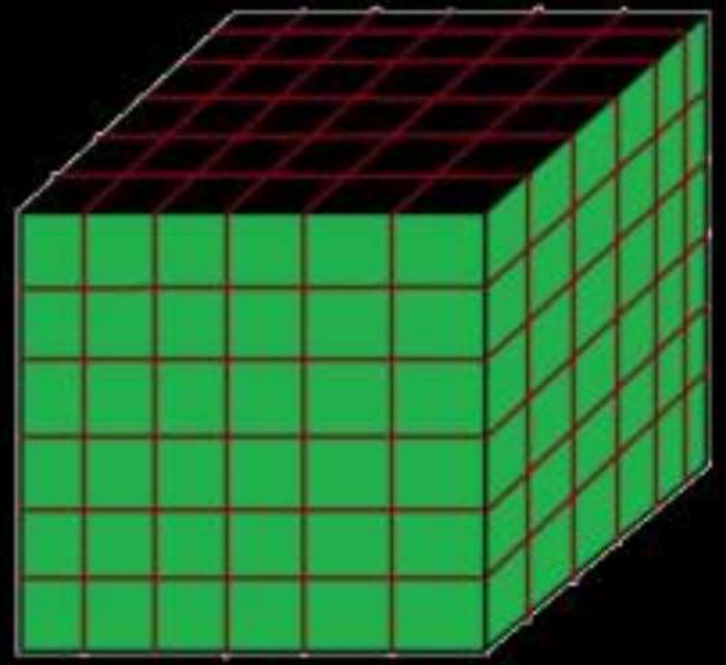
Sol.

A Cube was painted on one of the opposite pair faces as black & remaining four faces as green. five cuts were given on each edges to form smaller Cubes of equal size.



Sol.

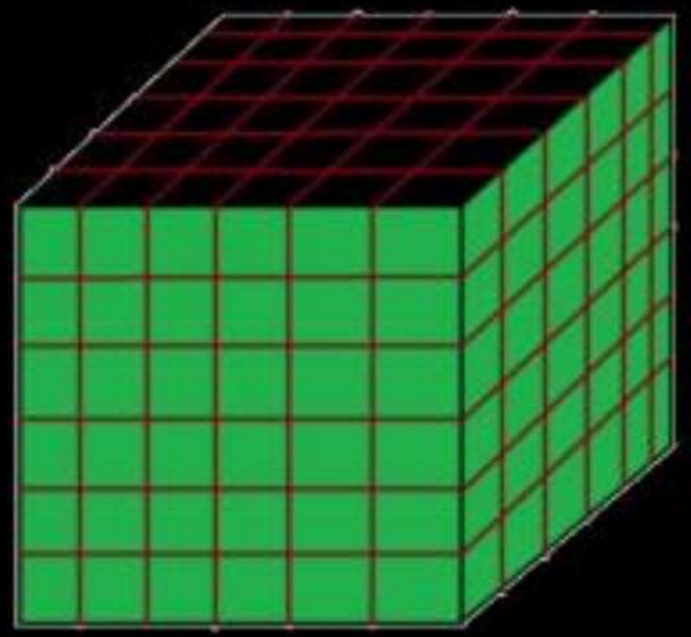
A Cube was painted on one of the opposite pair faces as black & remaining four faces as green. five cuts were given on each edges to form smaller Cubes of equal size.



CUBES

How many cubes will be formed?

216



CUBES

5

'x' cut

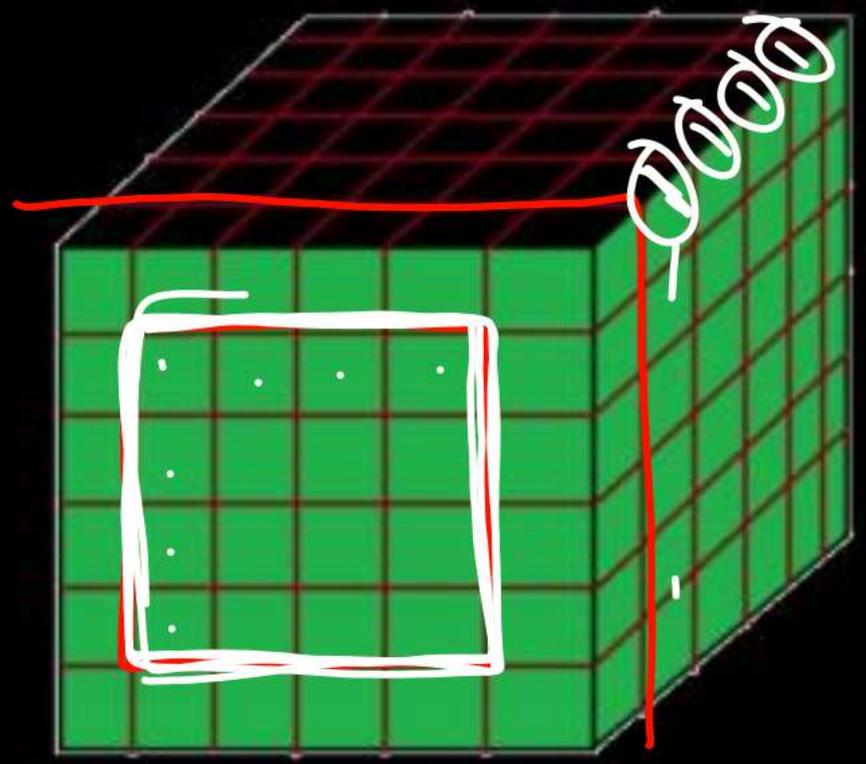
No. of cubes = $(x+1)^3$

$(5+1)^3$

$= 216$

How many cubes will have no face painted at all?

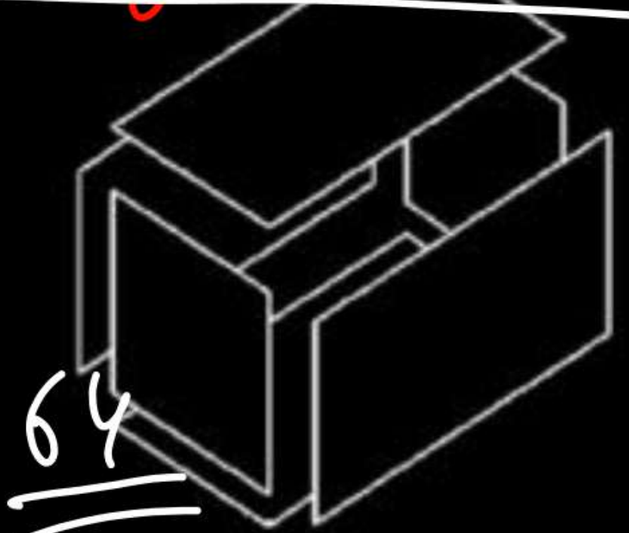
64



No. of cubes having x face painted

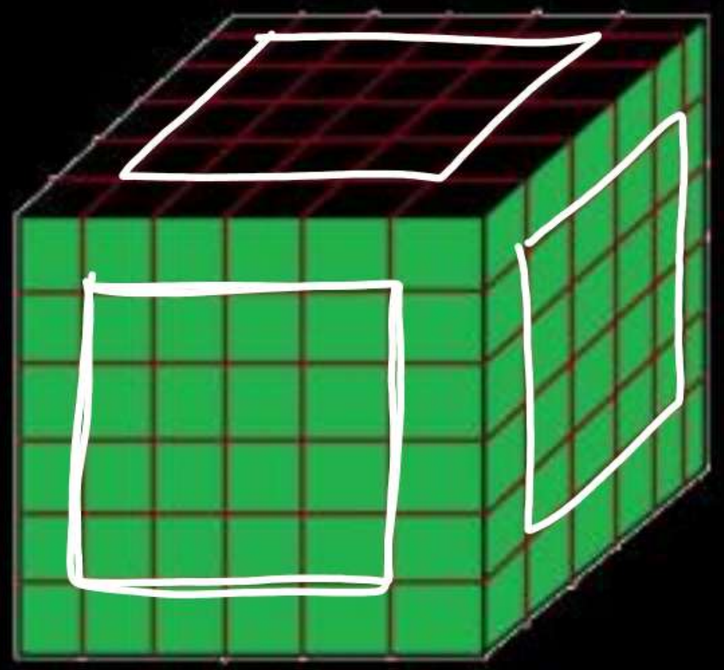
$= (x-1)^3$

$4^3 = 64$



CUBES

How many cubes will have only one face painted?



$16 \times 6 = 96$

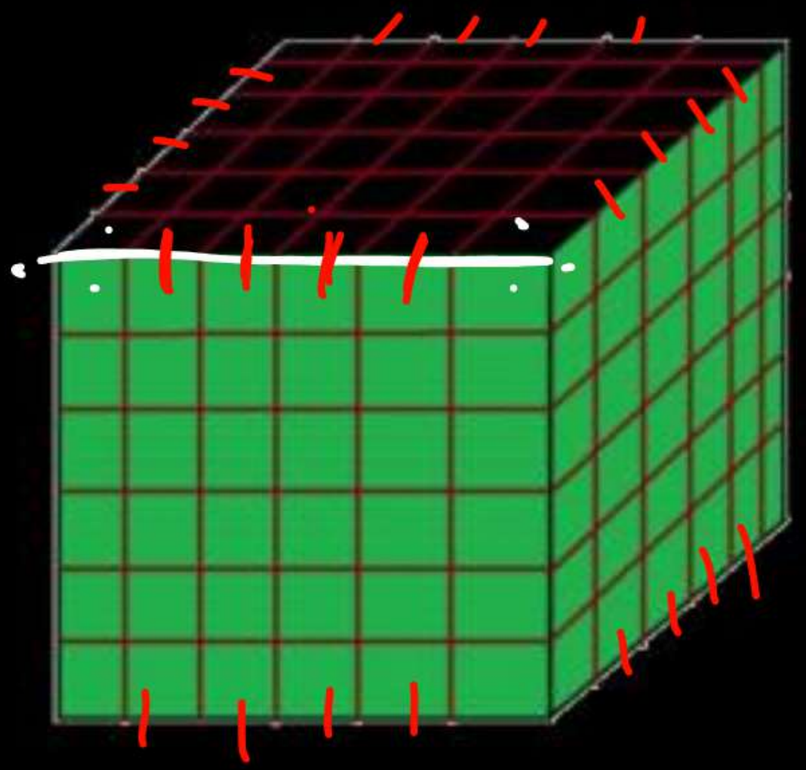
CUBES

$12 \times 4 = 48$

How many cubes will have only two face painted, but with same colour?

different

32

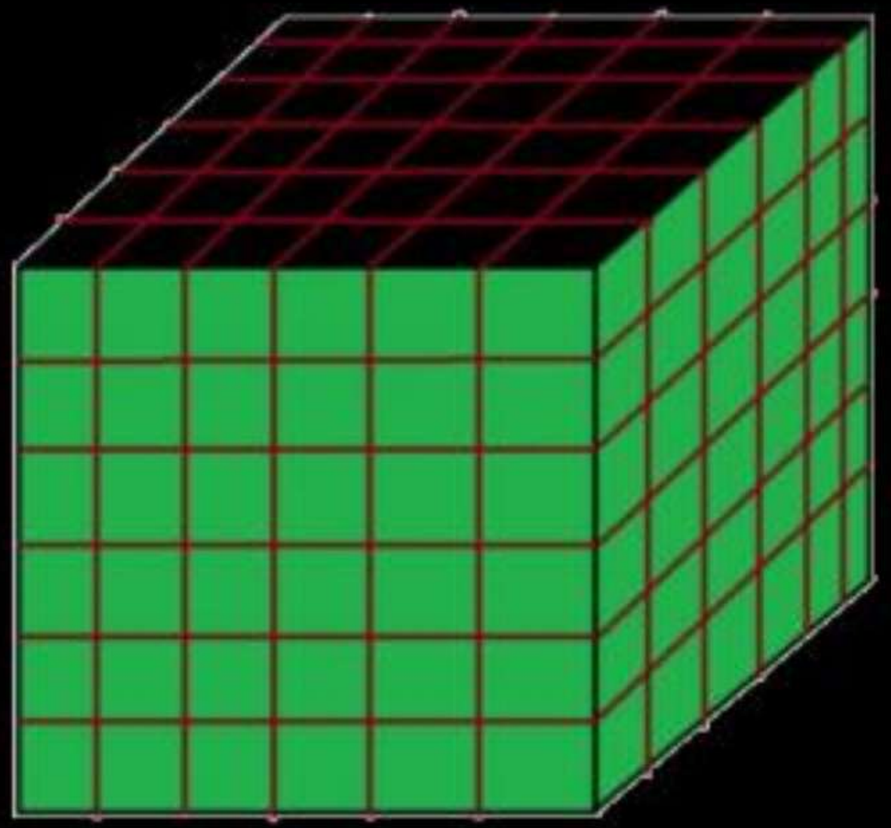


4×4

$= 16$

CUBES

How many cubes will have atleast two face painted?

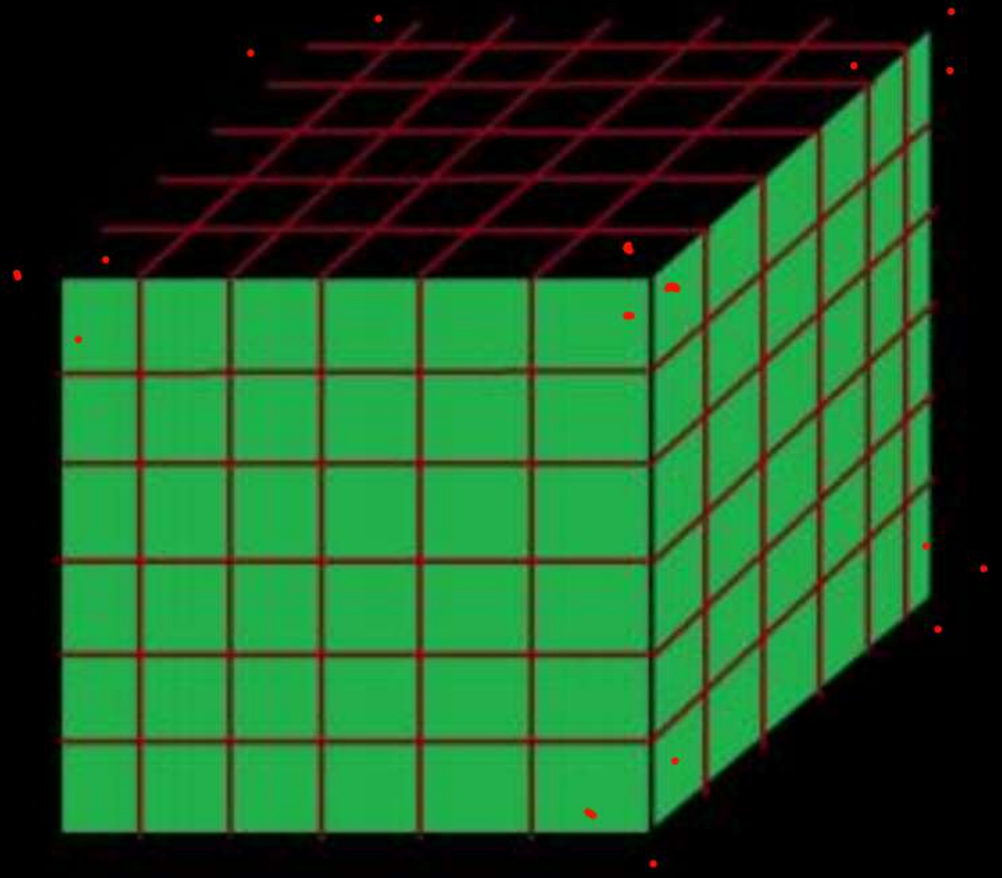


48
+ 8
56

CUBES

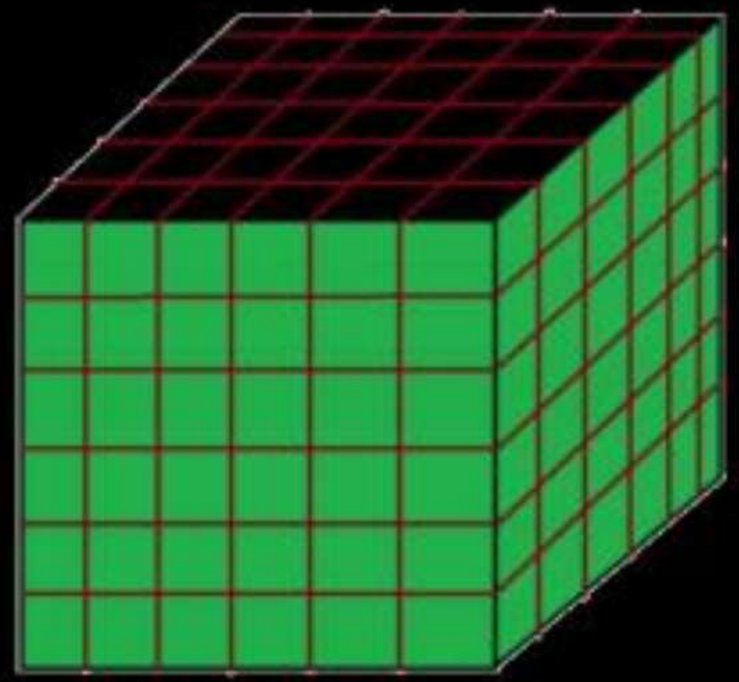
How many cubes will have three face painted?

8



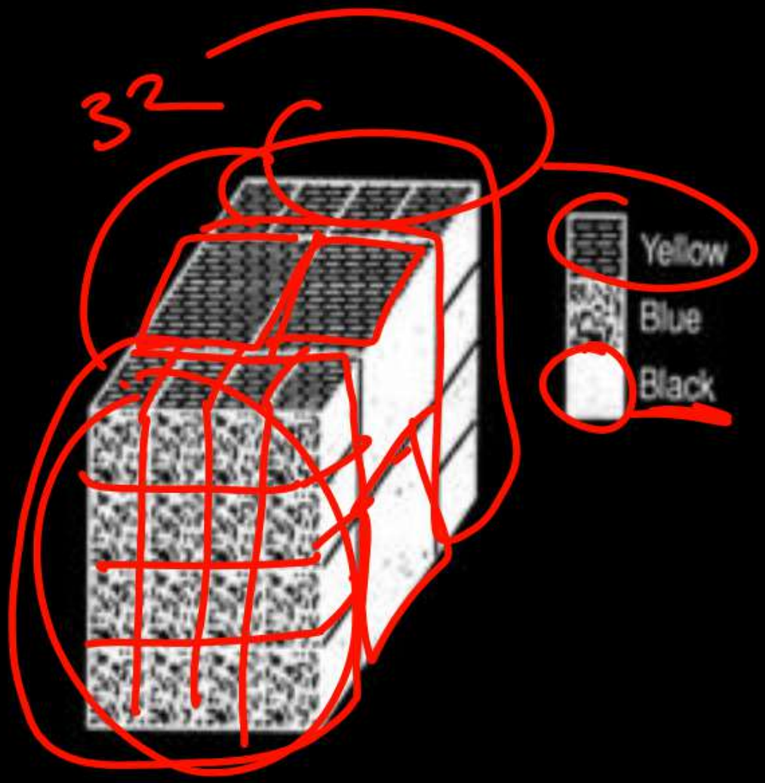
CUBES

- Ans 1 : 216
- Ans 2 : 64
- Ans 3 : 96
- Ans 4 : 16
- Ans 5 : 32
- Ans 6 : 56
- Ans 7: 8



Brainstorming

A solid cube has been painted yellow, blue and black on pairs of opposite face. The cube is the cut into 36 smaller cubes such that 32 cubes are of the same size while 4 others are of bigger size. Also no face of any of the bigger cubes is painted blue.



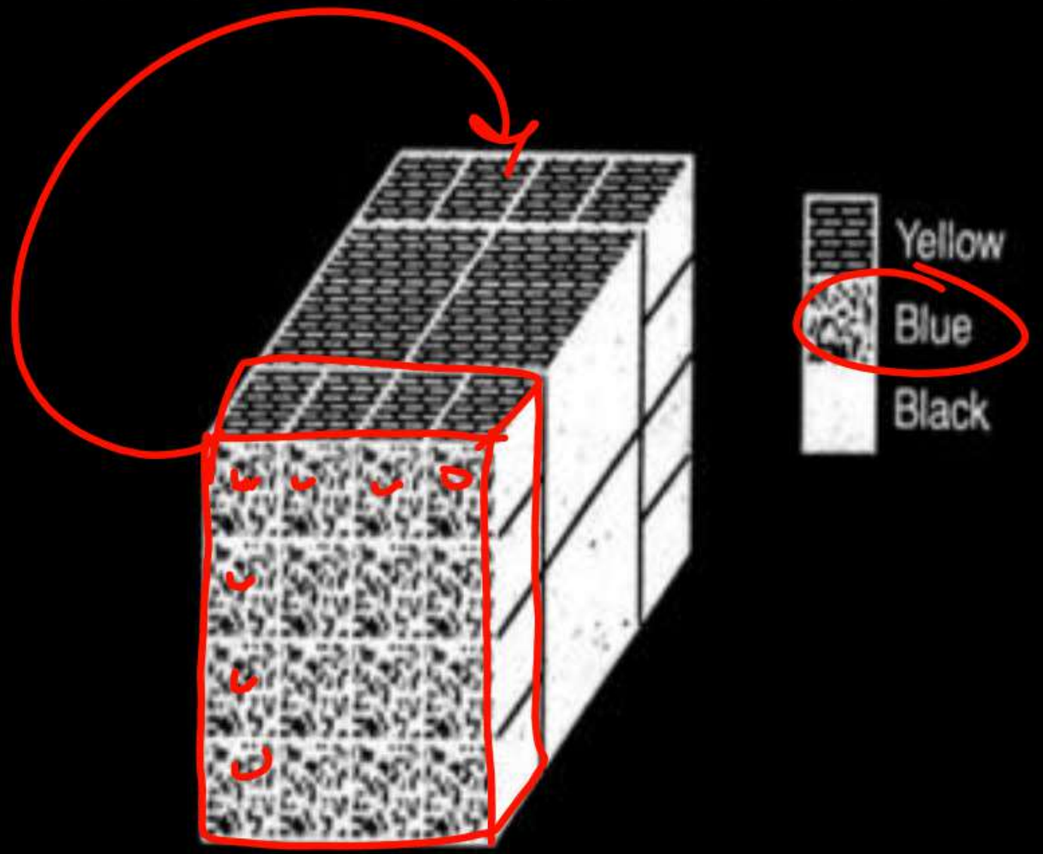
Q. How many cubes have at least one face painted blue.

A 0

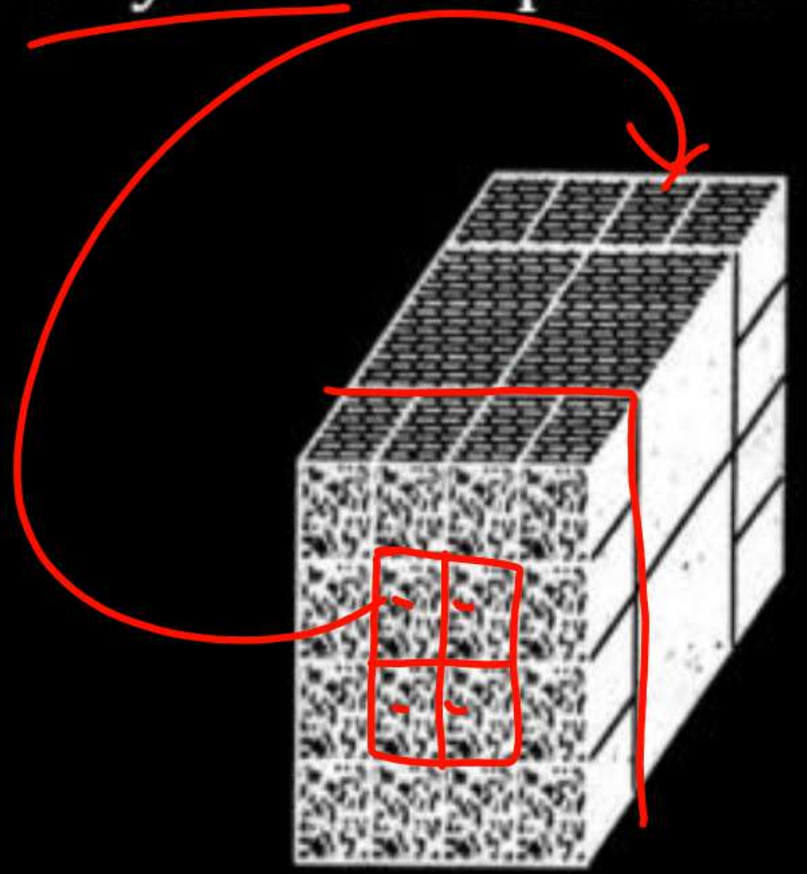
B 8

C 16

D 32



Q. How many cubes have only one face painted.



A 12

B 8

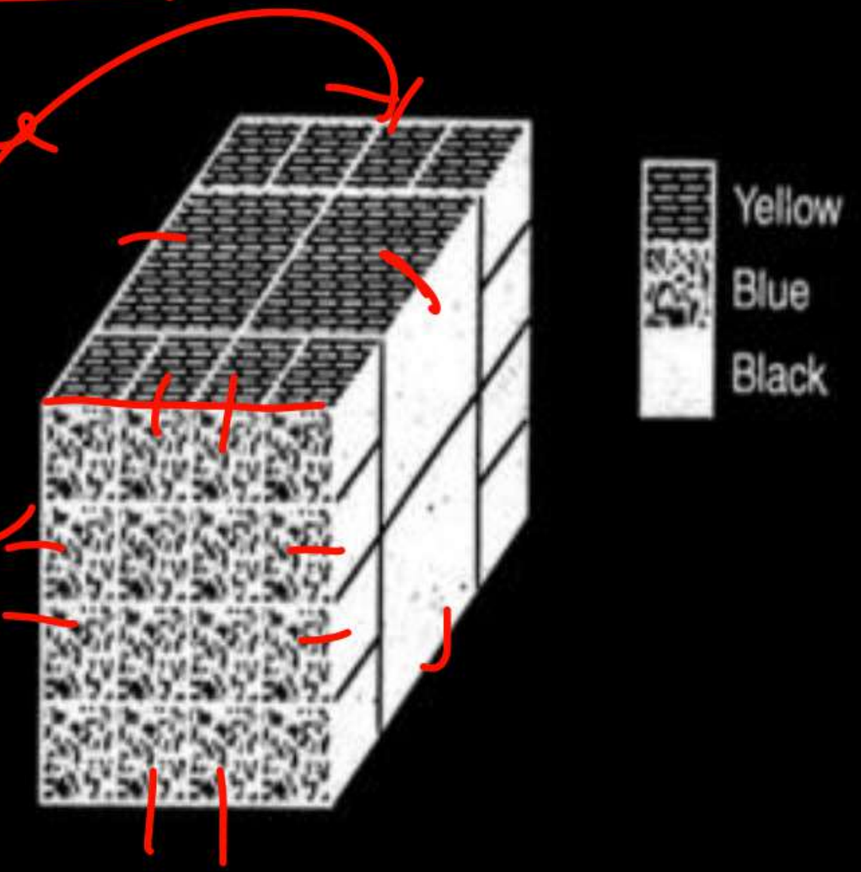
C 4

D 0

Q. How many cubes have two or more faces painted.

36 − 8 = 28

8 → Three faces



A 36

B 34

C 28

D 24

Small = 16

Big = 4

20

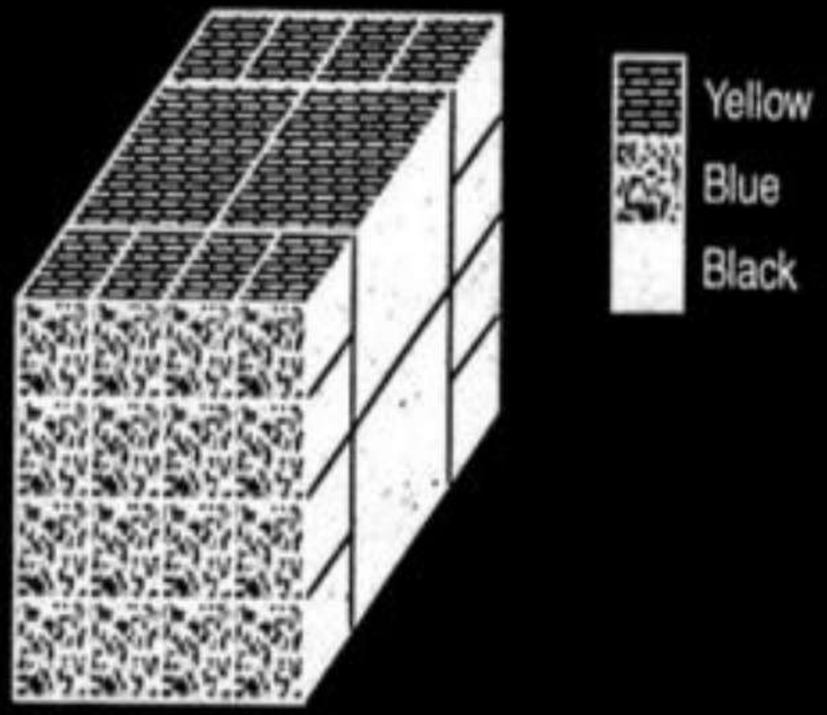
Q. How many cubes only three faces painted?

A 8

B 4

C 2

D 0



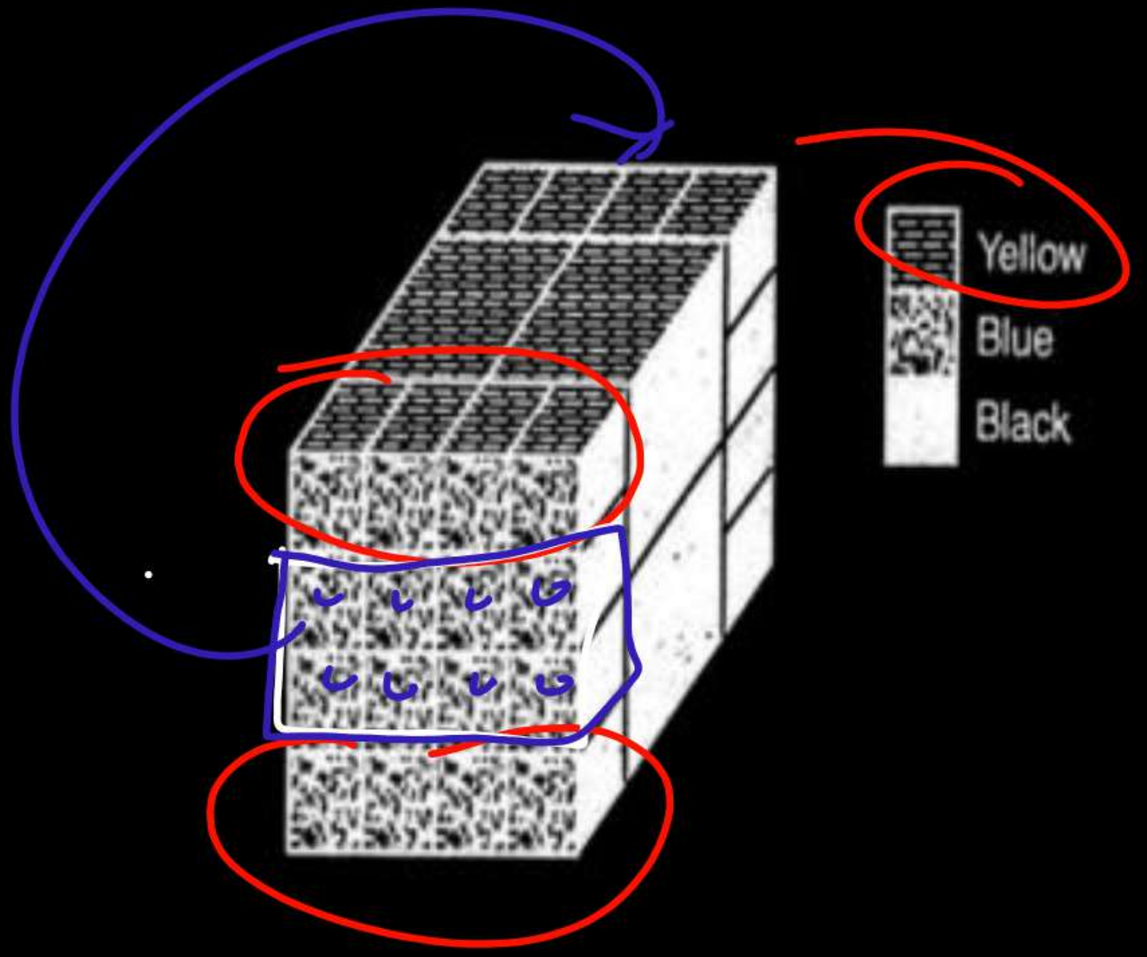
Q. How many cubes do not have any of their faces painted yellow?

A 0

B 8

C 16

D 20



Q. How many cubes have at least one of their faces painted black ?

A 0

B 8

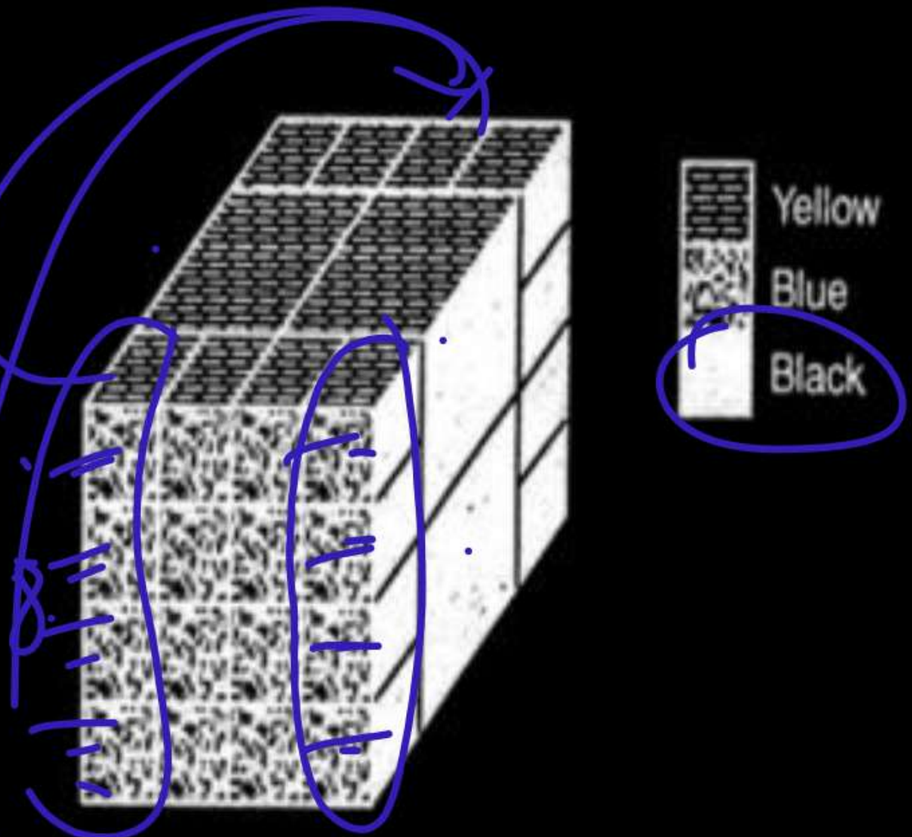
C 16

D 20

Big = 4

Small = 16

20



Q. How many cubes have at least one of their faces painted yellow or blue?

A 36

B 32

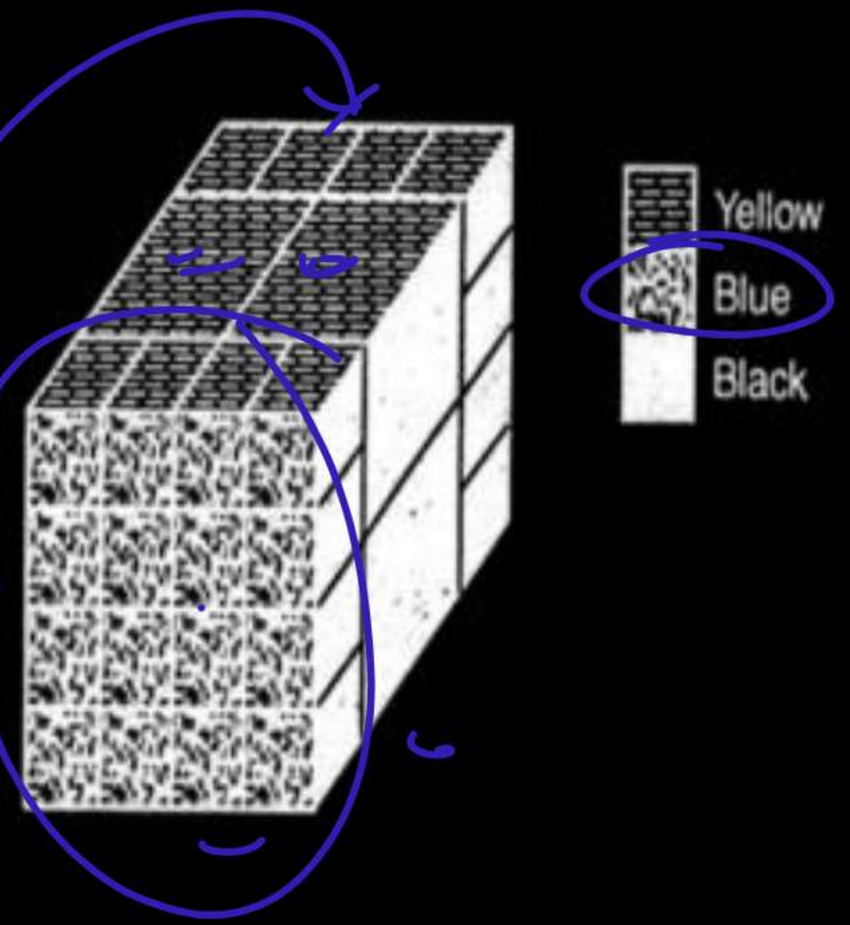
C 16

D 0

Small = 32

Big = 4

36



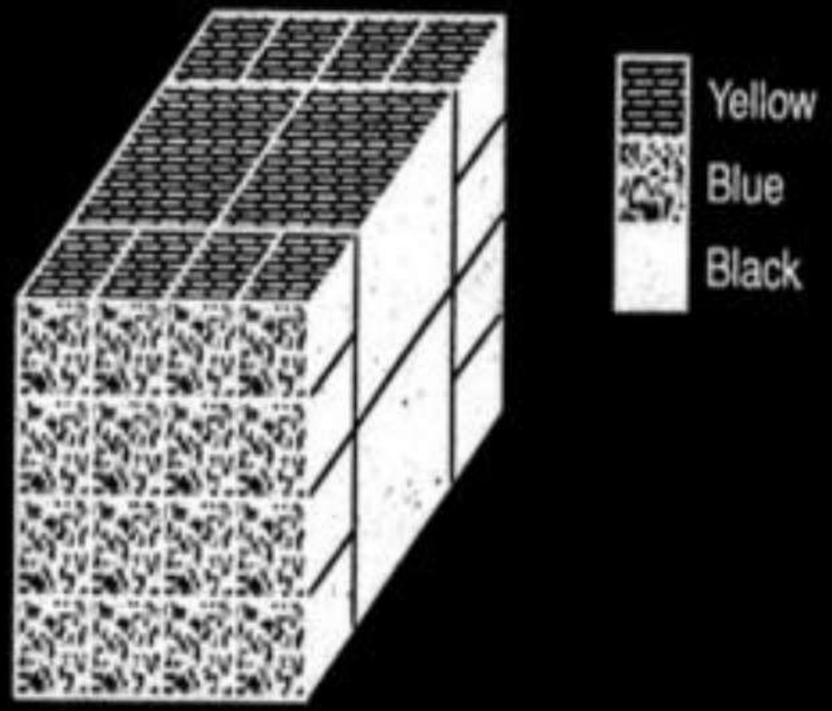
Q. How many cubes have no face painted?

A 0

B 8

C 12

D 16



Q. How many cubes have two faces painted yellow and black respectively?

A 0

B 8

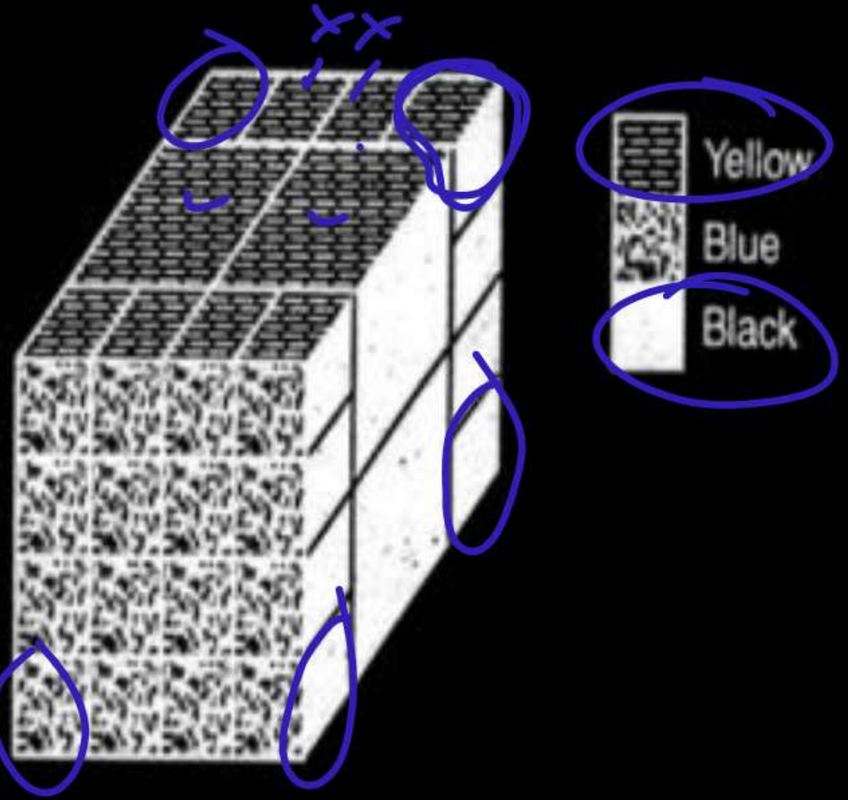
C 12

D 16

Big = 4

Small = 8

12




thank you