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Factors & Consecutive Integers

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Factors &
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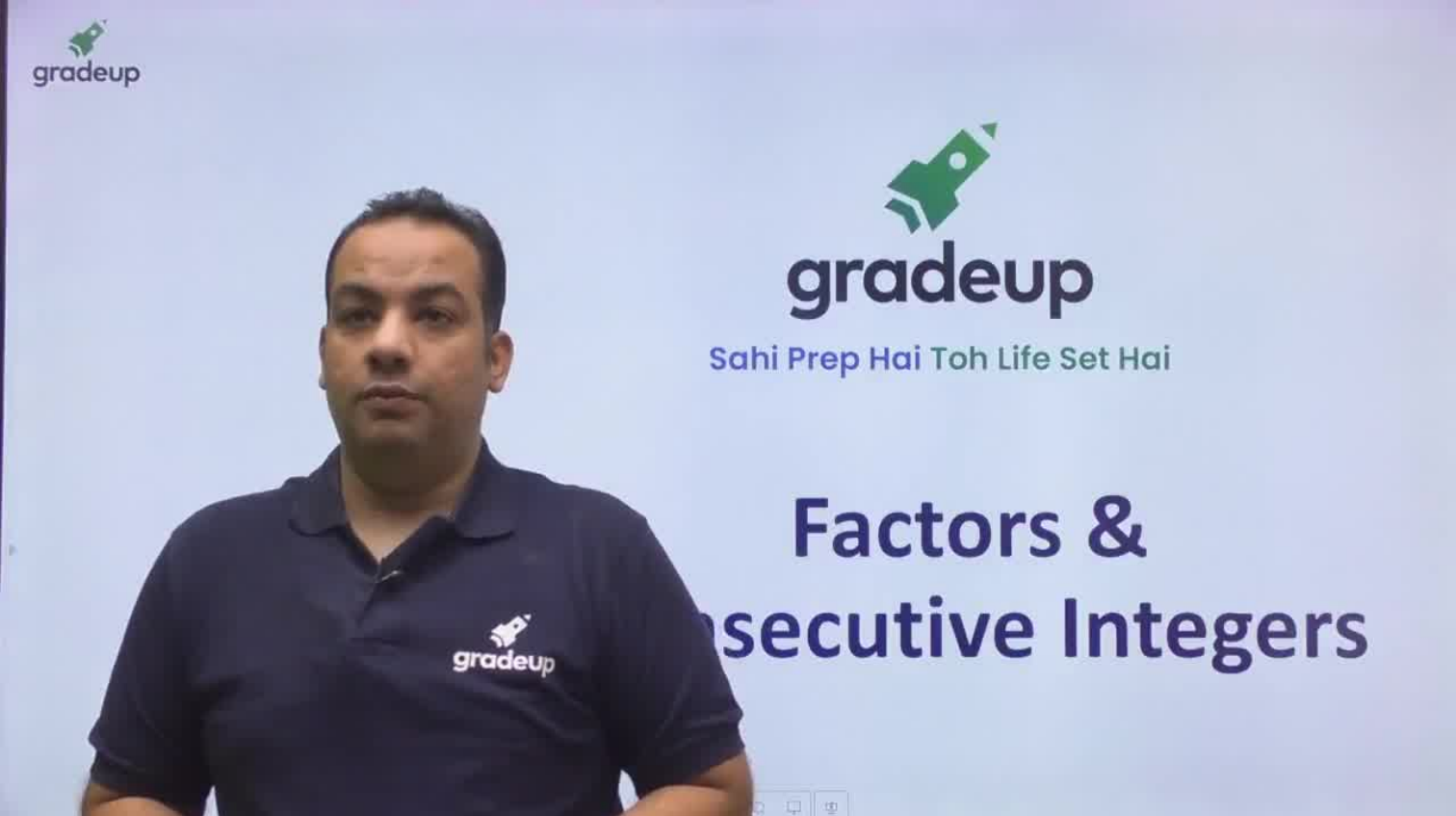
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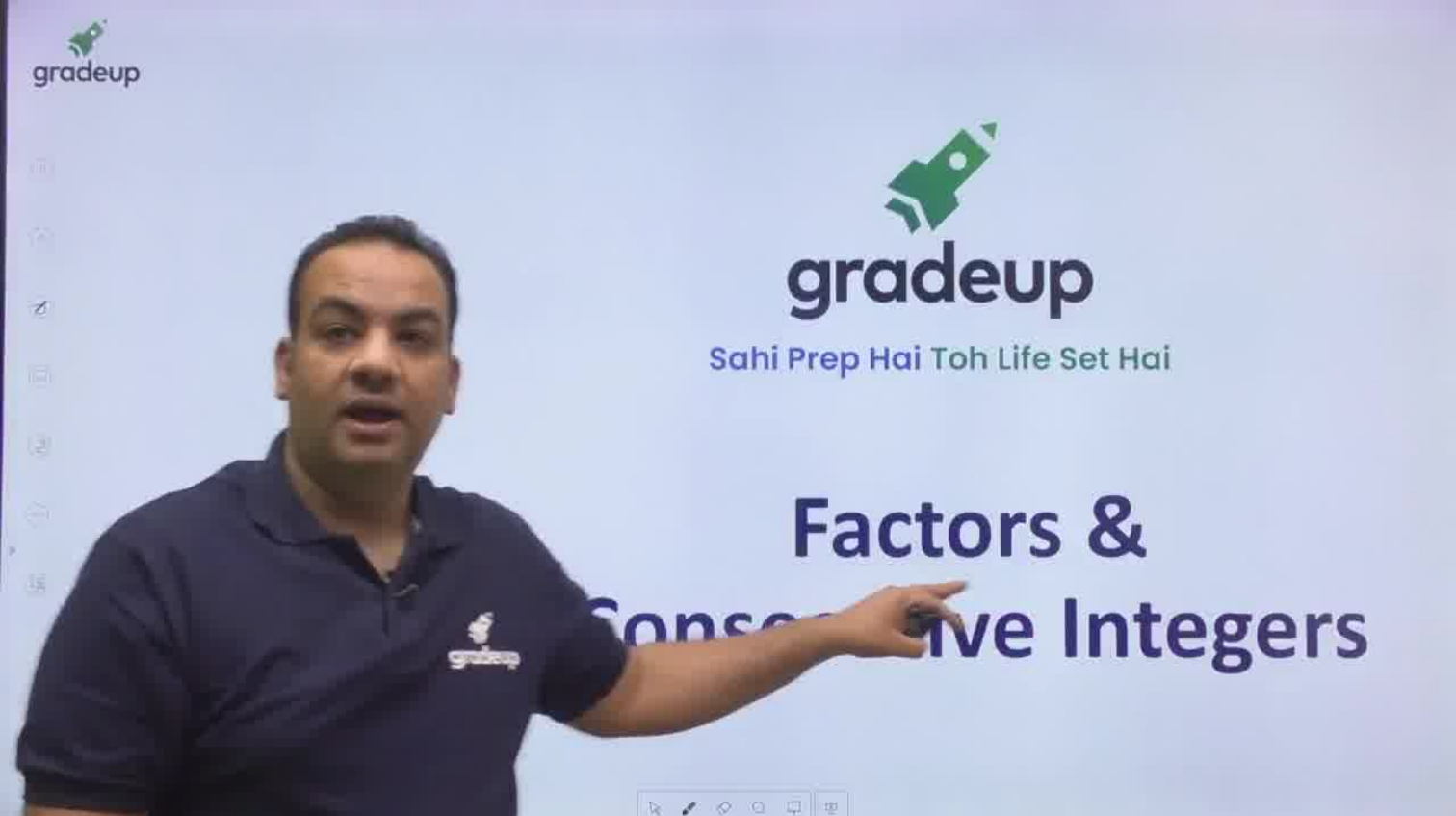
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Factors &
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Factors →

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Factors → 65

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Factors → 65 min - 70 min)

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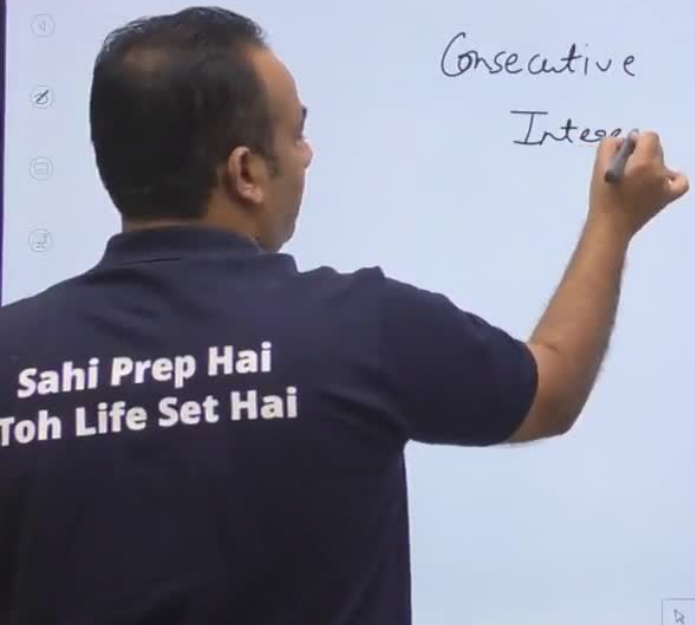
Factors → (65 min – 70 min)

Consecutive

Integ



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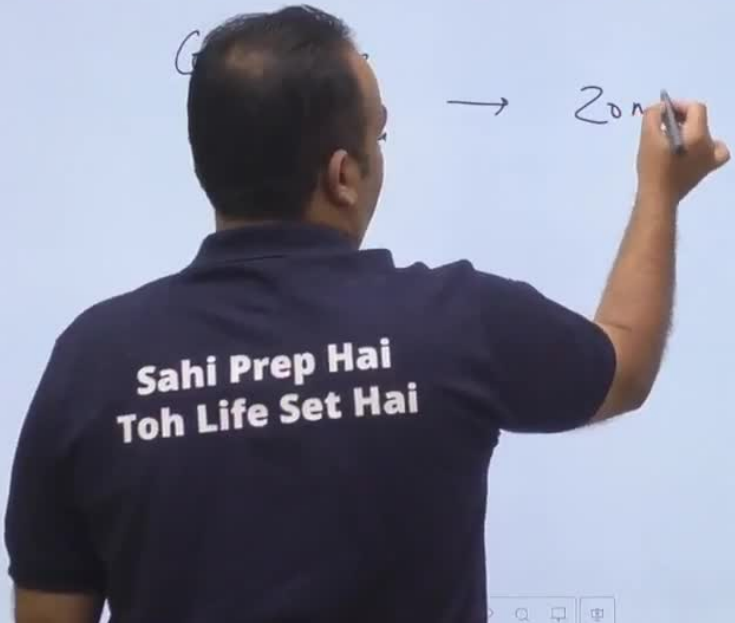
Factors → (65 min - 70 min)

→ 20



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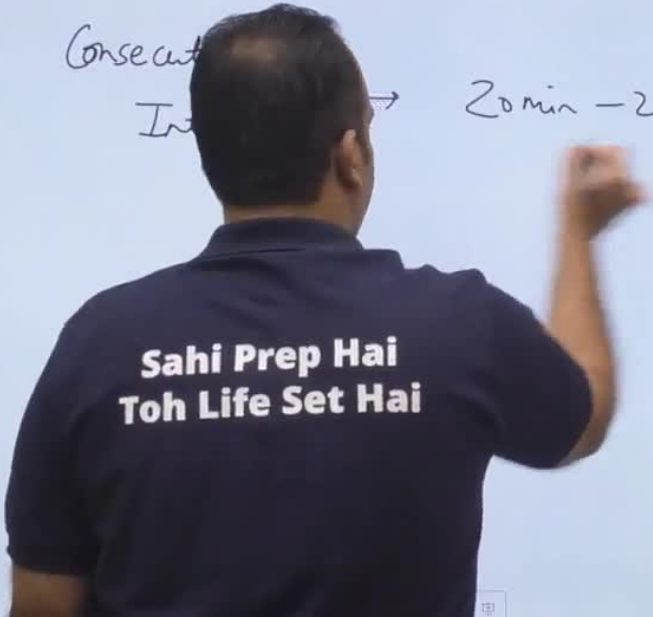
Factors → (65 min – 70 min)

Consecut
In → 20 min – 25 min



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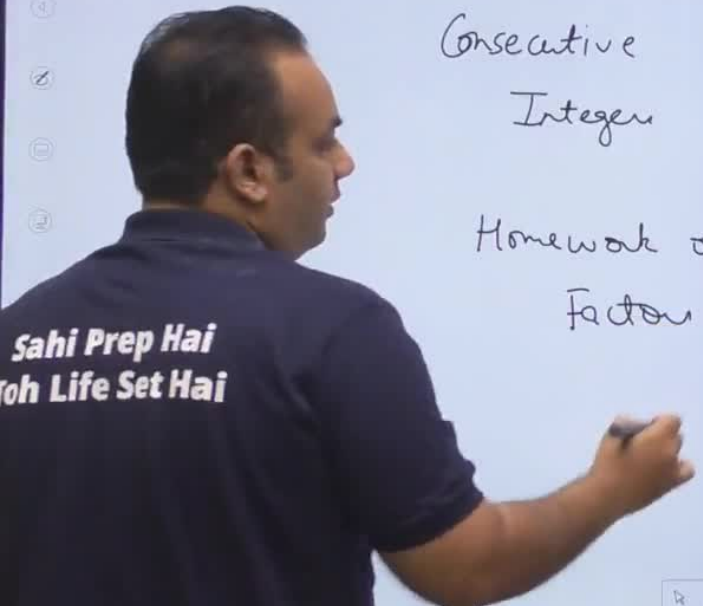
Factors → (65 min – 70 min)

Consecutive Integers → 20 min – 25 min

Homework of Factors



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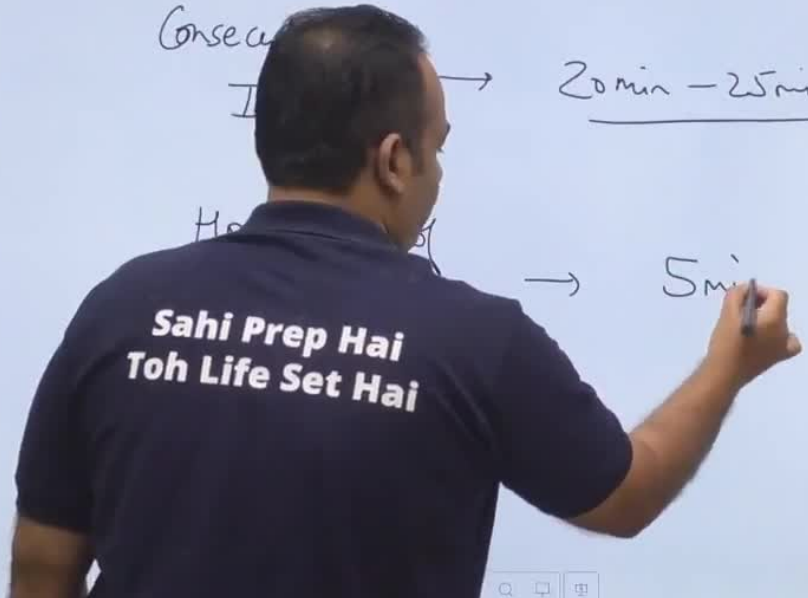
Factors → (65 min – 70 min)

Consec

→ 20 min – 25 min

→ 5 min



Factors → (65 min – 70 min)

Consecutive Integers → 20 min – 25 min

Homework of Factors → 5 min

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BASIC RULES OF EXPONENTS

$X^a . X^b = X^{a+b}$ e.g. $2^7 . 2^5 = 2^{12}$

$\frac{X^a}{X^b} = x^{a-b}$ e.g. $\frac{2^{11}}{2^5} = 2^6$

$(X^a)^b = X^{a.b}$ e.g. $(2^3)^4 = 2^{12}$

$(X)^0 = 1$ e.g. $2^0 = 1$

$(X)^{-m} = \frac{1}{X^m}$ e.g. $2^{-3} = \frac{1}{2^3} = \frac{1}{8}$

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BASIC RULES OF EXPONENTS

$X^a . X^b = X^{a+b}$

e.g. $2^7 . 2^5 = 2^{12}$

$\frac{X^a}{X^b} = x^a$

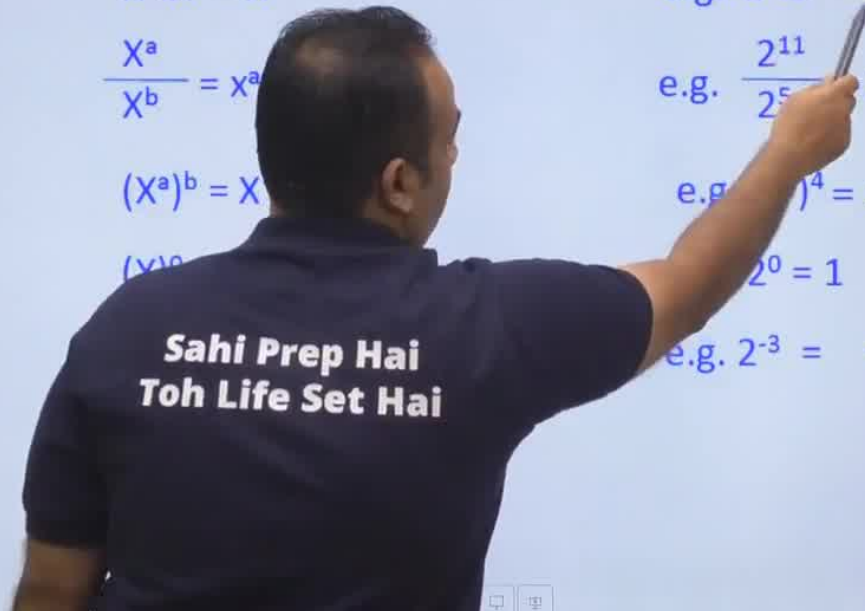
e.g. $\frac{2^{11}}{2^5} = 2^6$

$(X^a)^b = X$

e.g. $)^4 = 2^{12}$

$2^0 = 1$

e.g. $2^{-3} = \frac{1}{2^3} = \frac{1}{8}$



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BASIC RULES OF EXPONENTS

$X^a . X^b = X^{a+b}$ e.g. $2^7 . 2^5 = 2^{12}$

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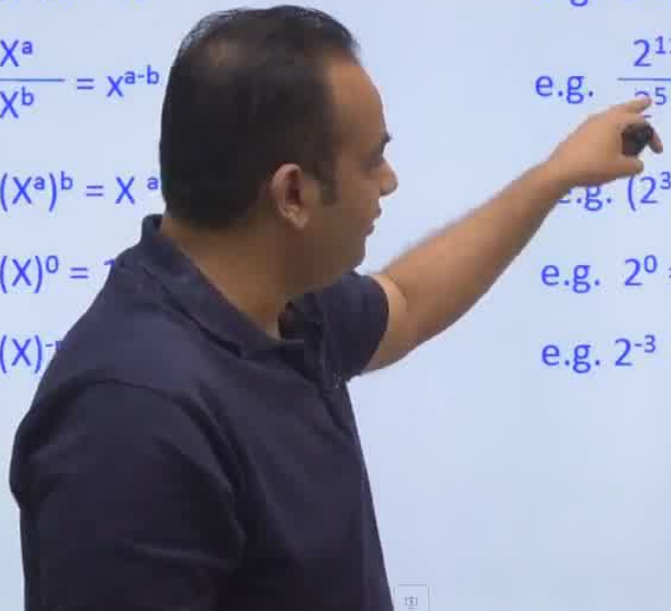
$(X^a)^b = X^{a}$ e.g. $(2^3)^4 = 2^{12}$

$(X)^0 =$ e.g. $2^0 = 1$

$(X)^{-}$ e.g. $2^{-3} = \frac{1}{2^3} = \frac{1}{8}$



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$$X^{a^b} \neq X^{a \cdot b}$$

$$2^{3^4} = 2^{81}$$

$$2^{4^3} = 2^{64}$$


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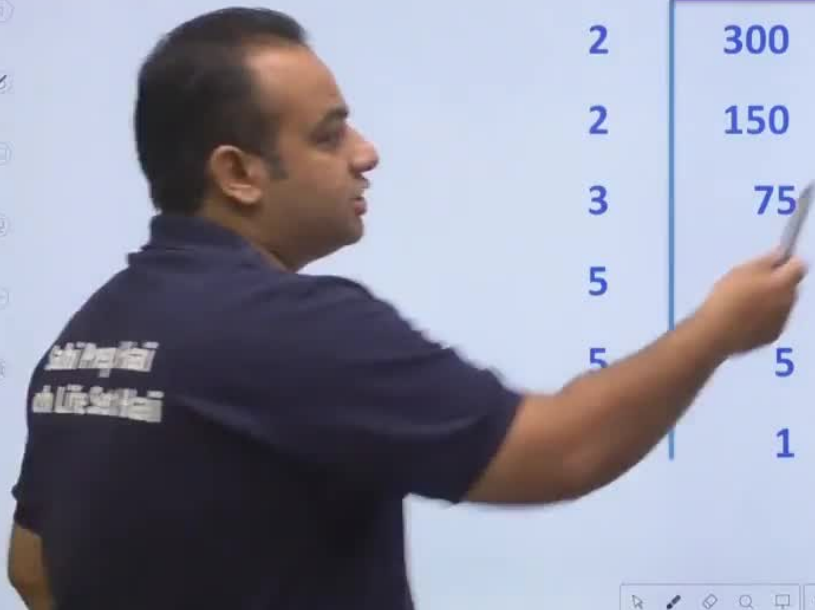
PRIME FACTORIZATION OF A NUMBER

Prime Factorization of a Number N= 300

2	300
2	150
3	75
5	
5	5
	1

$300 = 2^2 3^1 5^2$



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eg $3^{5^2} = 3^{25}$

$5^{8^3} = 5^{512}$

$3^{2^3} = 3^{8}$

$X^{a^b} \neq X^{a \cdot b}$

$2^{3^4} = 2^{81}$

$2^{4^3} = 2^{64}$

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eg $3^{5^2} = 3^{25}$

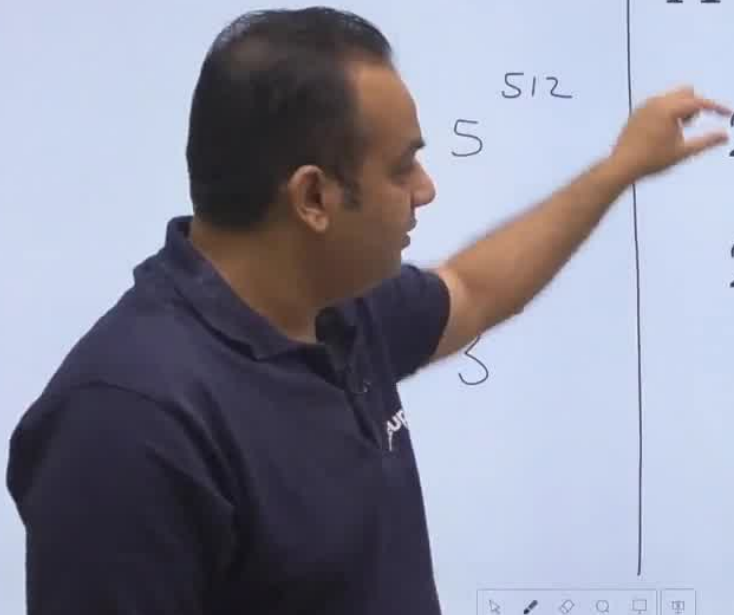
5^{512}

3

$X^{a^b} \neq X^{a \cdot b}$

$2^{3^4} = 2^{81}$

$2^{4^3} = 2^{64}$



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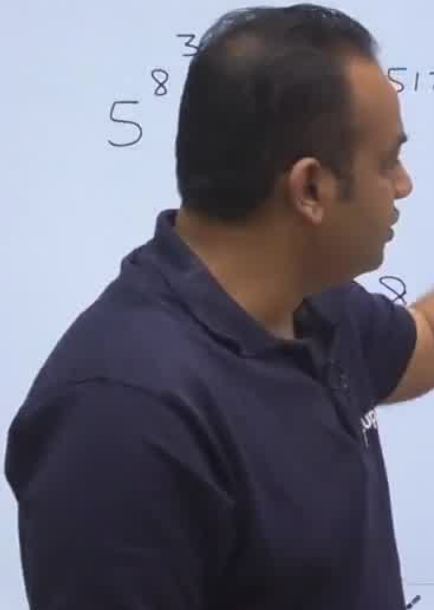
eg $3^{5^2} = 3^{25}$

5^{8^3} 512

$X^{a^b} \neq X^{a \cdot b}$

$2^{3^4} = 2^{81}$

$2^{4^3} = 2^{64}$



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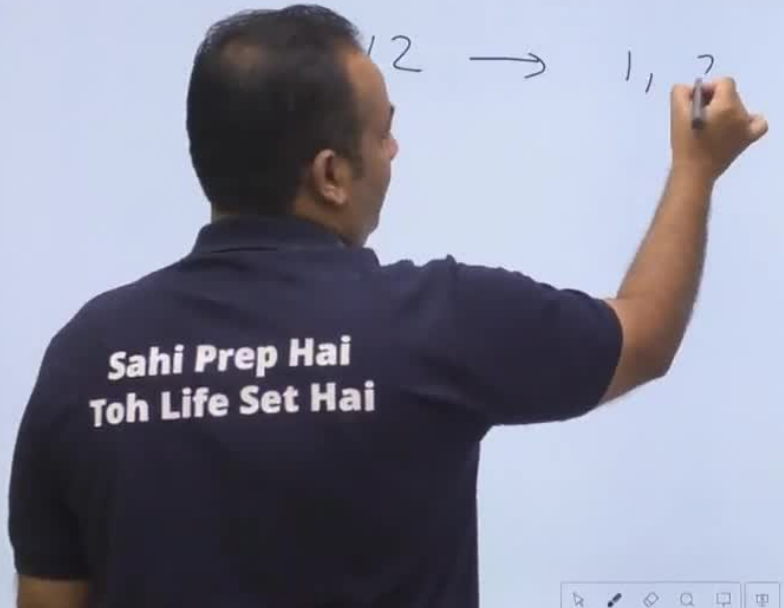
FACTORS OF A NUMBER

12 → 1, 2



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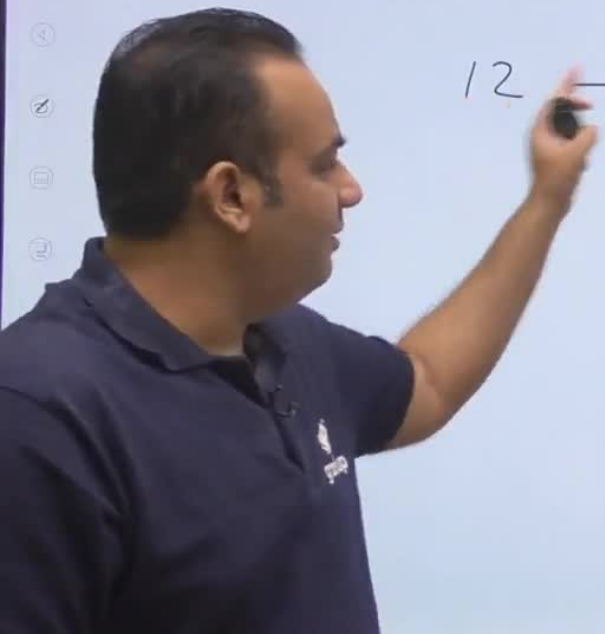
FACTORS OF A NUMBER

12 → 1, 2, 3, 4, 6, 12



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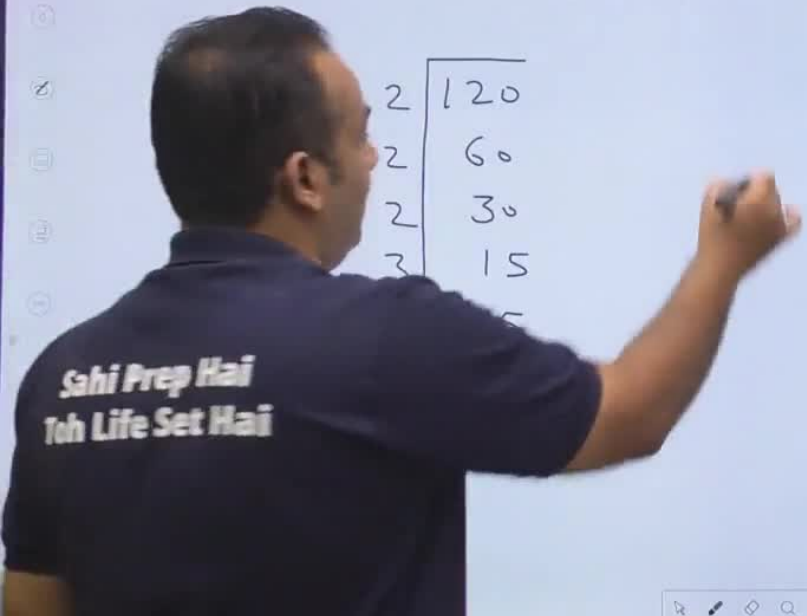
HOW TO CALCULATE FACTORS OF A NUMBER

$N = 120$

2	120
2	60
2	30
3	15



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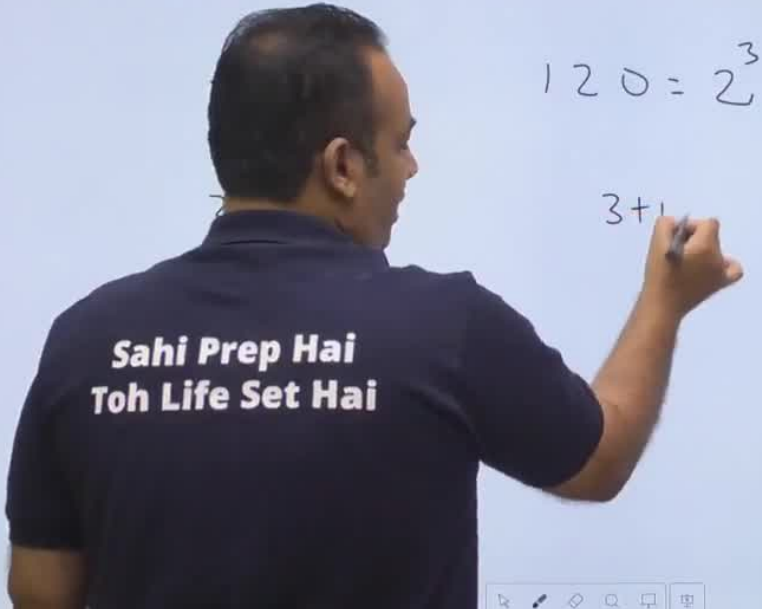
HOW TO CALCULATE FACTORS OF A NUMBER

$N = 120$

$120 = 2^3 \cdot 3^1 \cdot 5^1$

$3+1$



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HOW TO CALCULATE FACTORS OF A NUMBER

$N = 120$

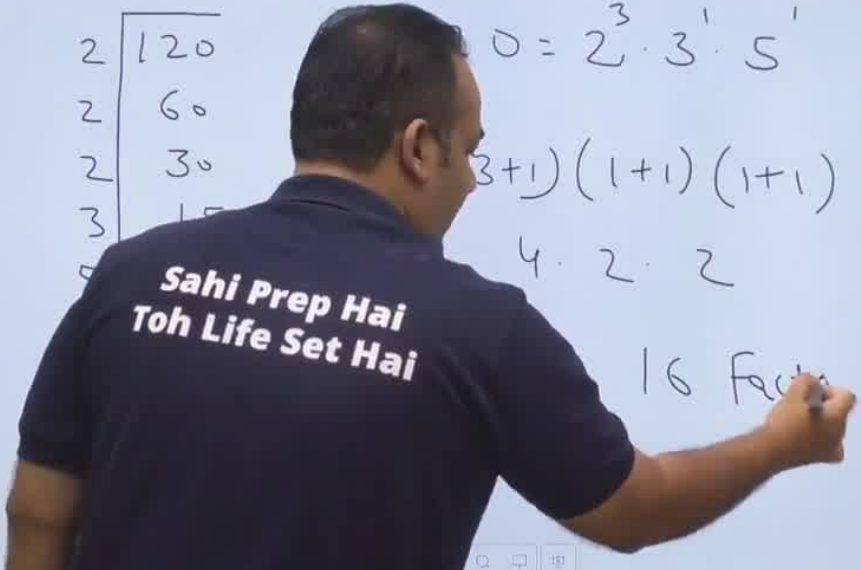
2	120
2	60
2	30
3	15
5	5
	1

$120 = 2^3 \cdot 3^1 \cdot 5^1$

$(3+1)(1+1)(1+1)$

$4 \cdot 2 \cdot 2$

16 Fac



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HOW TO CALCULATE FACTORS OF A NUMBER

$N = 120$

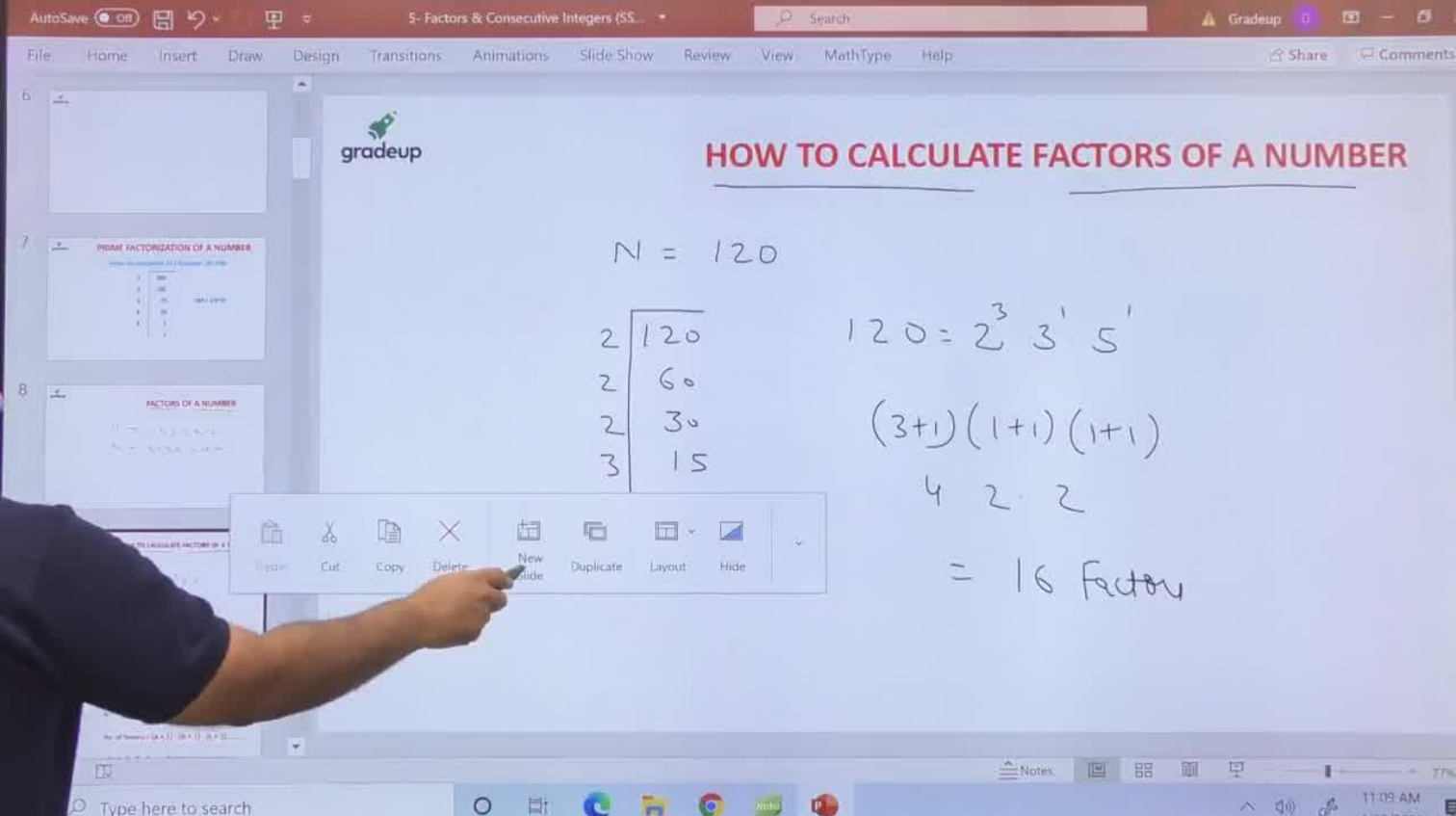
2	120
2	60
2	30
3	15
5	5
	1

$120 = 2^3 \cdot 3^1 \cdot 5^1$

$(3+1)(1+1)(1+1)$

$4 \cdot 2 \cdot 2$

$= 16$ Factors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HOW TO CALCULATE FACTORS OF A NUMBER
N = 120
2 | 120
2 | 60
2 | 30
3 | 15
120 = 2^3 3^1 5^1
(3+1)(1+1)(1+1)
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= 16 Factors
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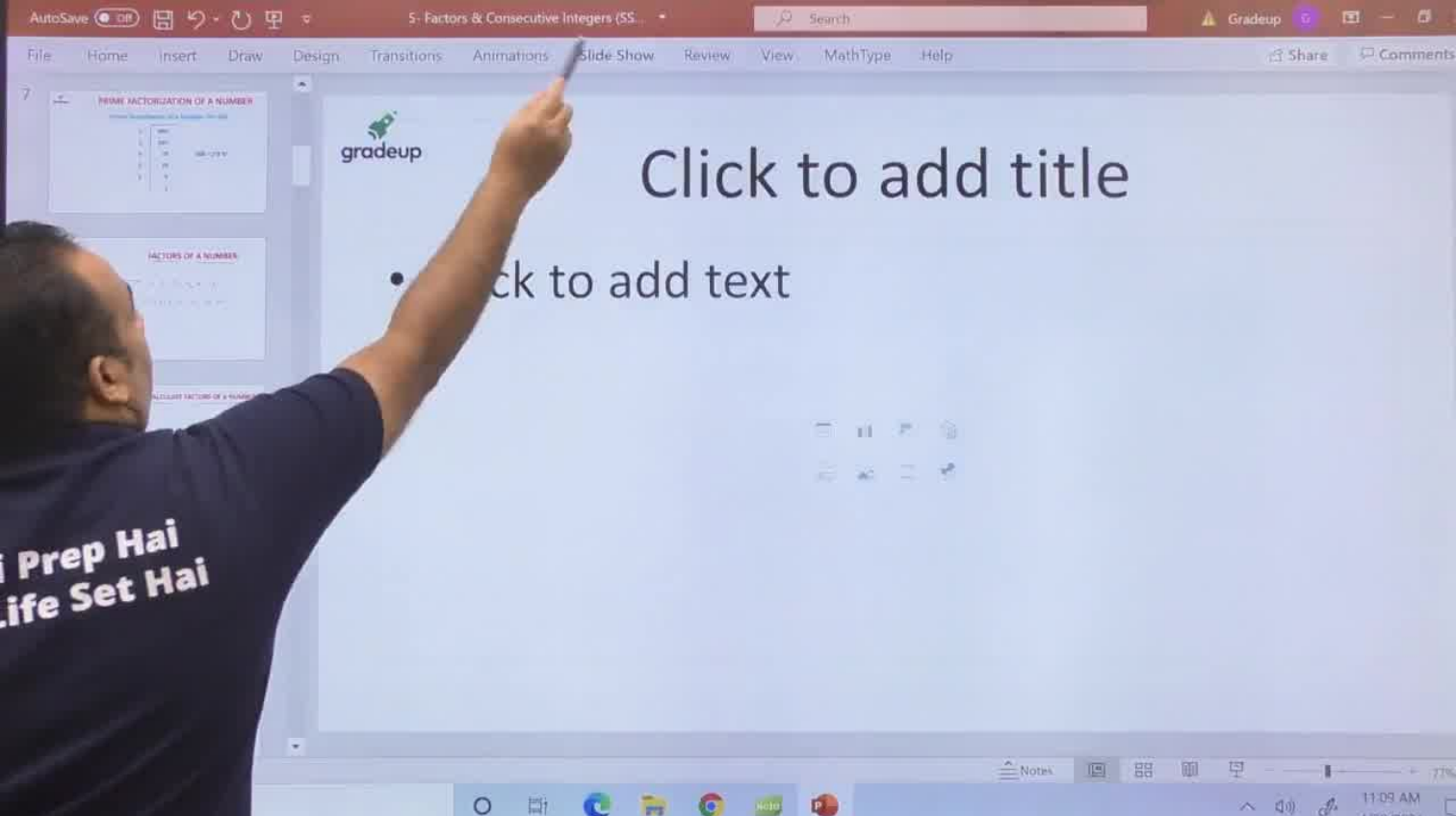
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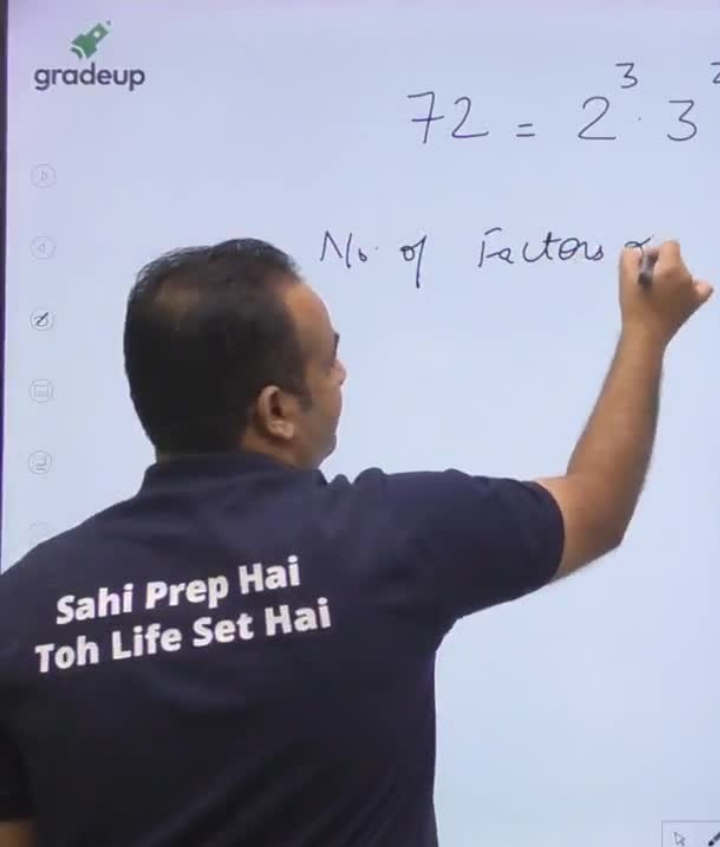
$$72 = 2^3 \cdot 3^2$$

No. of Factors of



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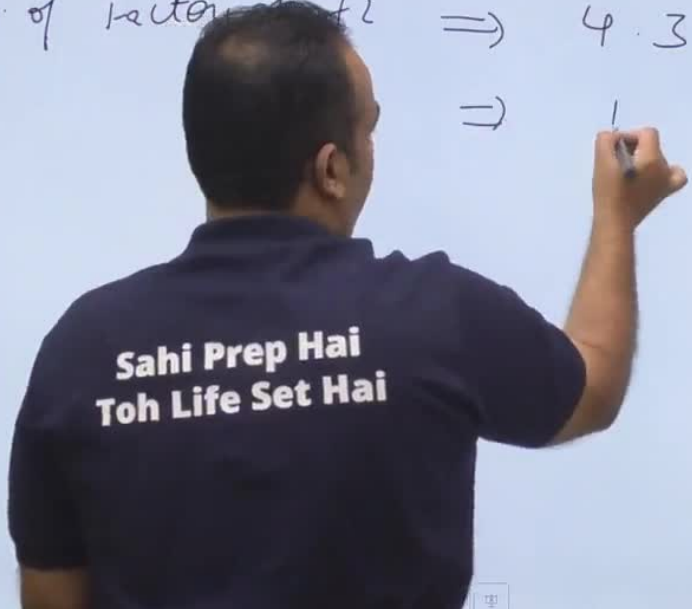
$$72 = 2^3 \cdot 3^2$$

No. of Factors of 72 $\Rightarrow$ $4 \cdot 3$

$\Rightarrow$ 1



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$72 = 2^3 3^2$

Factors of 72 $\Rightarrow$ 4 . 3

$\Rightarrow$ 12

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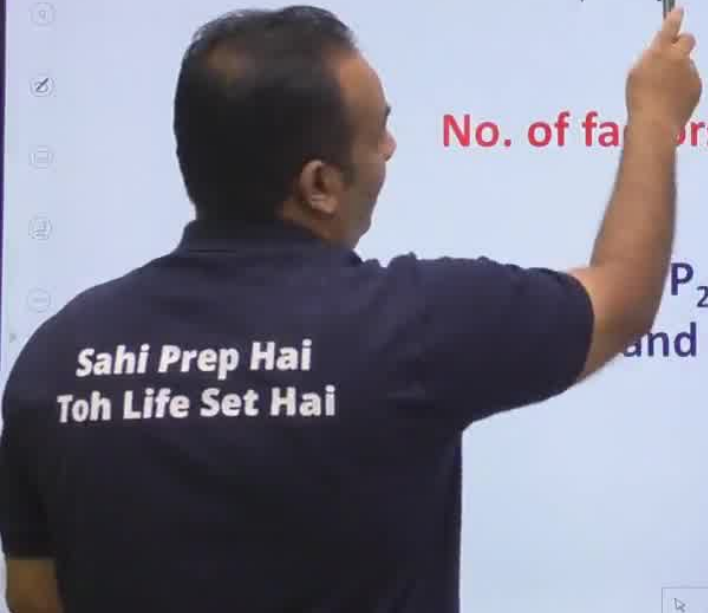
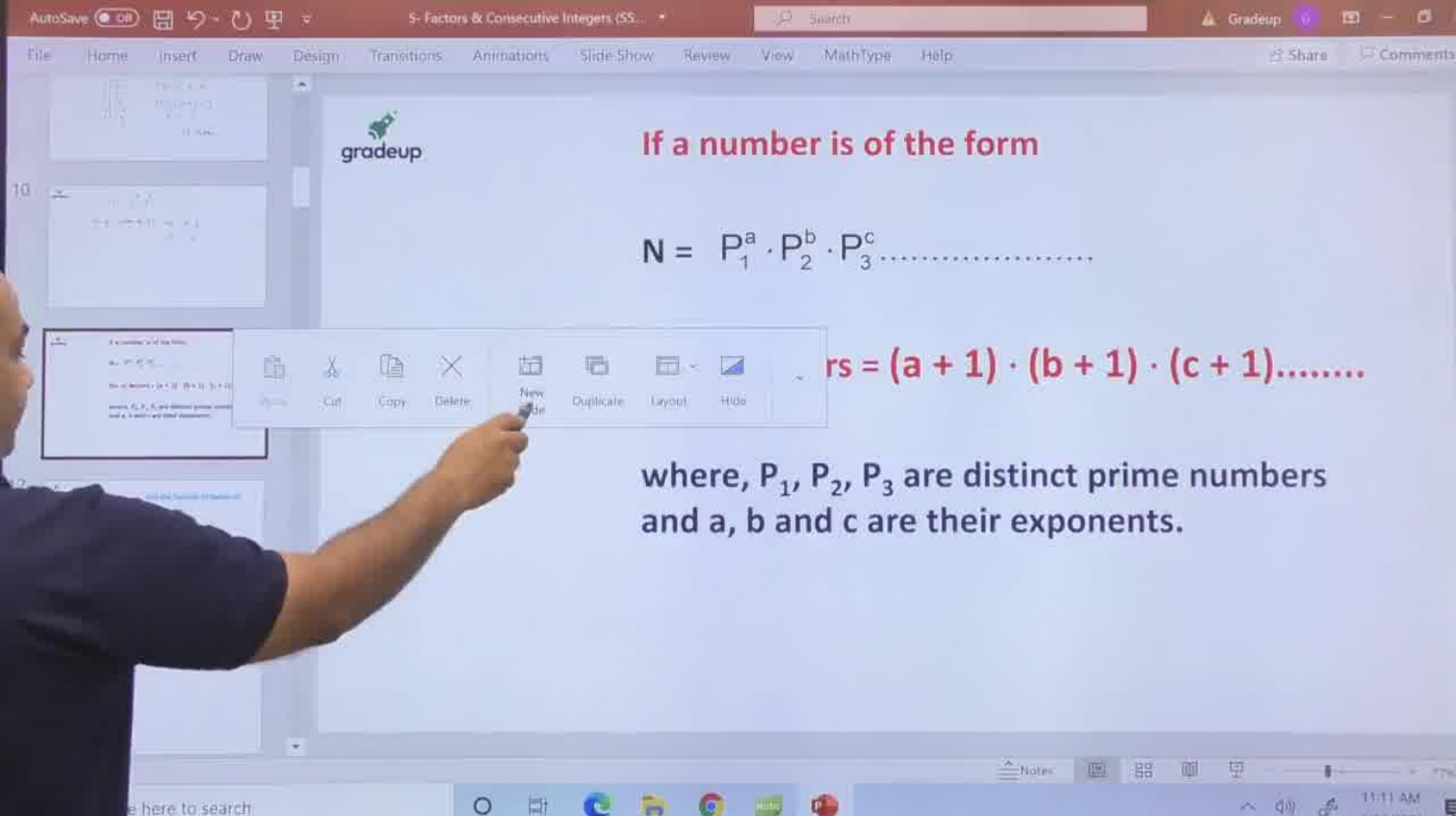
If a number is of the form

$N = P_1^a \cdot P_2^b \cdot P_3^c \ldots\ldots\ldots\ldots$

No. of fa...rs = $(a + 1) \cdot (b + 1) \cdot (c + 1)\ldots\ldots$

P_2, P_3 are distinct prime numbers
...nd c are their exponents.

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If a number is of the form
N = $P_1^a \cdot P_2^b \cdot P_3^c$.....
rs = (a + 1) · (b + 1) · (c + 1).....
where, P_1, P_2, P_3 are distinct prime numbers
and a, b and c are their exponents.
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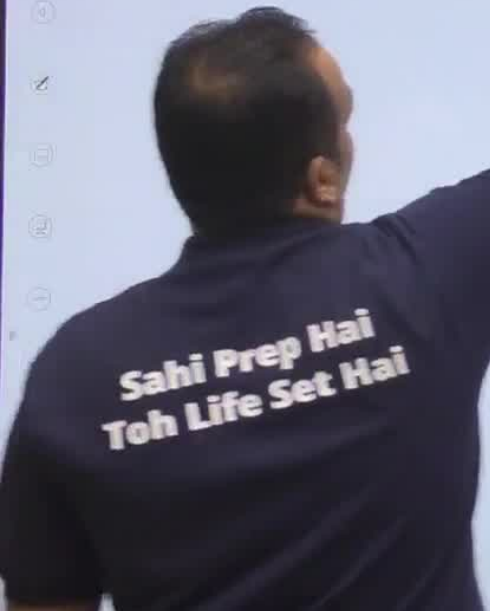
Reason



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Reason of Fe

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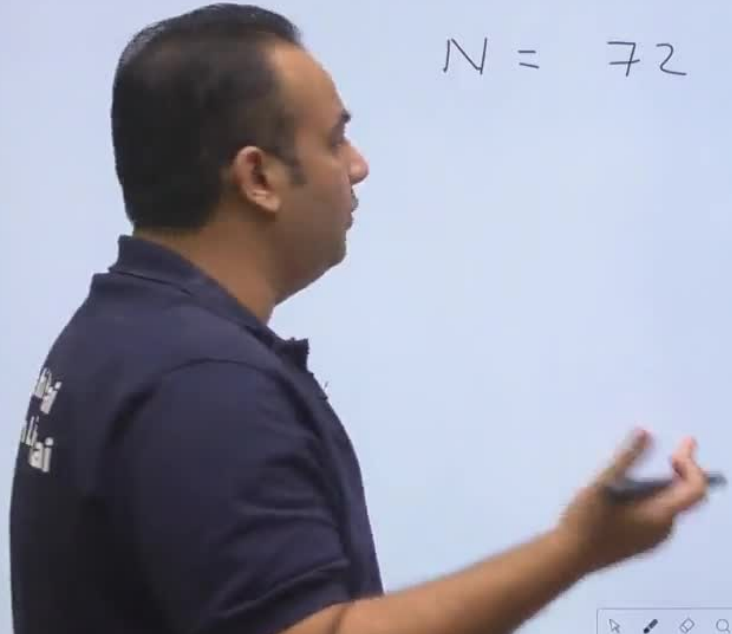
Reason of Formula

$N = 72$



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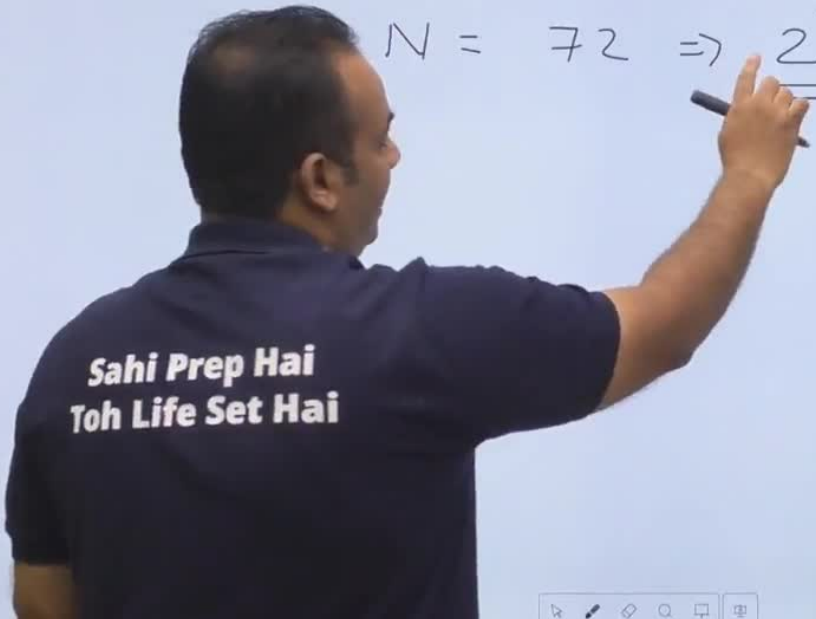
Reason of Formula

$N = 72 \Rightarrow 2^3 3^2$



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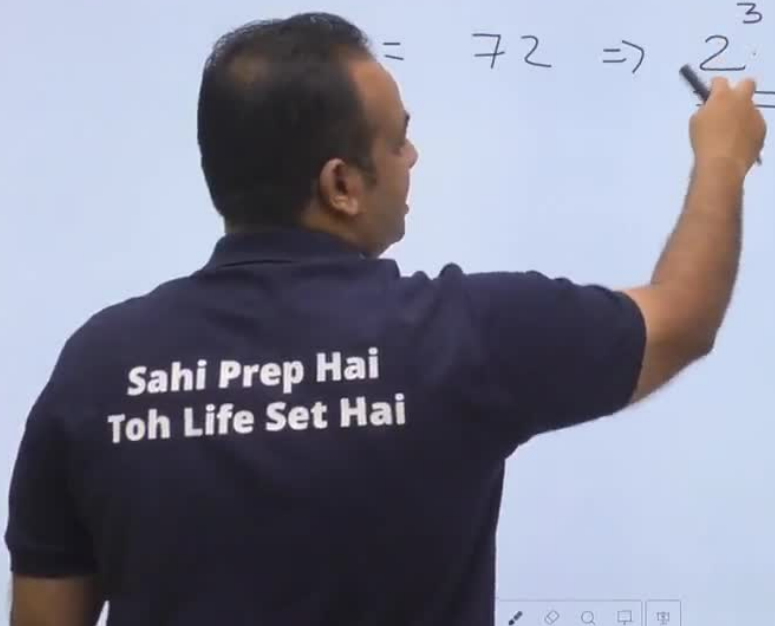
Reason of Formula

$= 72 \Rightarrow 2^3 3^2$



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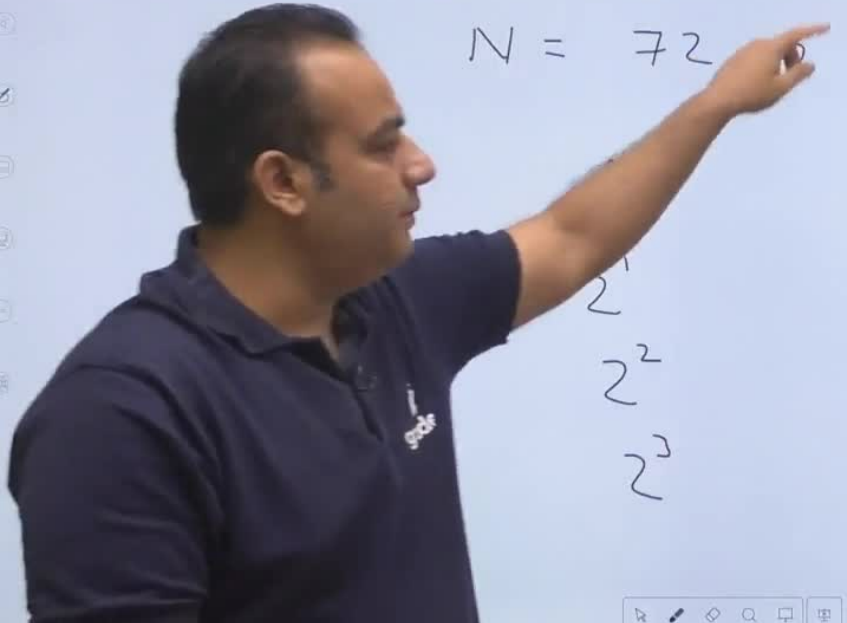
Reason of Formula

$N = 72 = 2^3 3^2$

2^1

2^2

2^3



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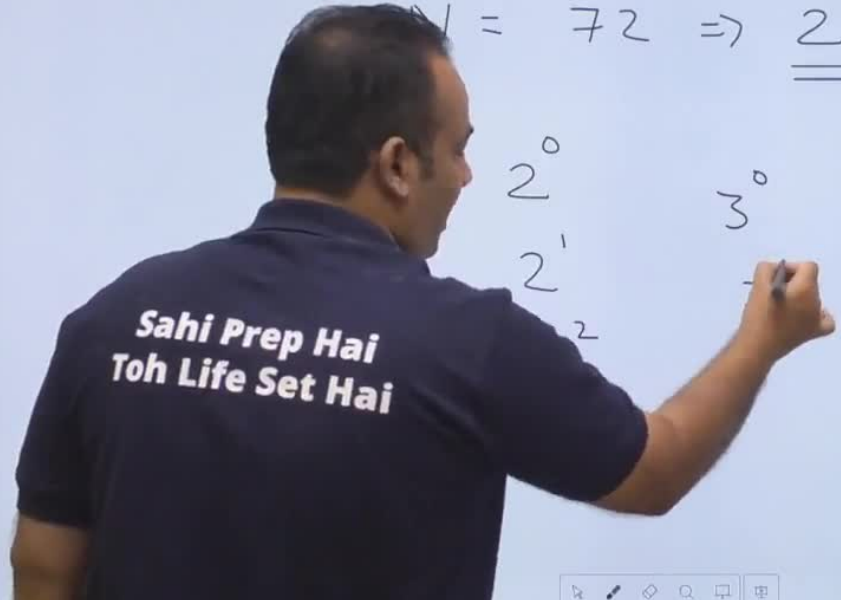
Reason of Formula

$= 72 \Rightarrow 2^3 3^2$

2^0 3^0

2^1

^{2}



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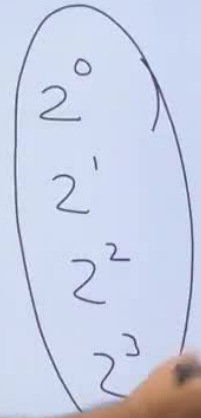
Reason of Formula

$N = 72 \Rightarrow 2^3 3^2$



3^0
3^1
3^2

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Reason of Formula

$N = 72 \Rightarrow 2^3 \cdot 3^2$

4×3

12 Fact

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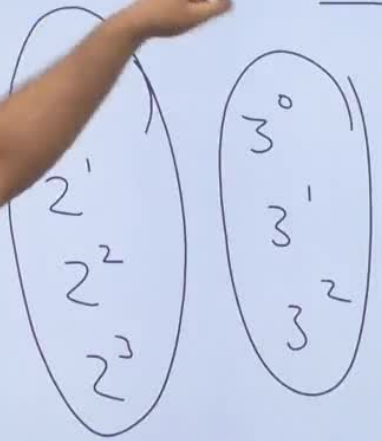
Reason of Formula

$N = 72 \Rightarrow 2^3 3^2$



4×3

$= 12$ Factors

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Reason of Formula

$2^0 \cdot 3^0 = 1$

$2^0 \cdot 3^1 =$

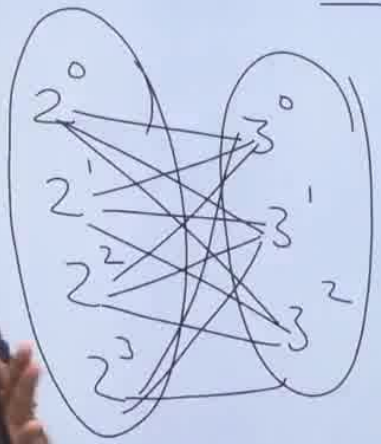
$2^0 \cdot 3^2 =$

$2^1 \cdot 3$ 8

$2^1 \cdot 3^1$ 24

72

$N = 72 \Rightarrow 2^3 3^2$



4×3

$= 12$ Factors

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Reason of Formula

$2^0 \cdot 3^0 = 1$

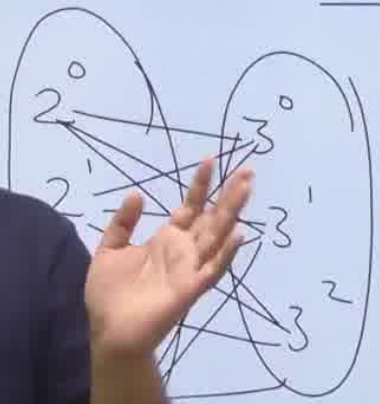
$2^0 \cdot 3^1 = 3$

$2^0 \cdot 3^2 =$

$2^1 \cdot 3^0 =$

$2^1 \cdot 3^1 =$

$N = 72 \Rightarrow 2^3 3^2$



4×3

$= 12$ Factors

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Reason of Formula

$2^0 \cdot 3^0 = 1$

$2^0 \cdot 3^1 = 3$

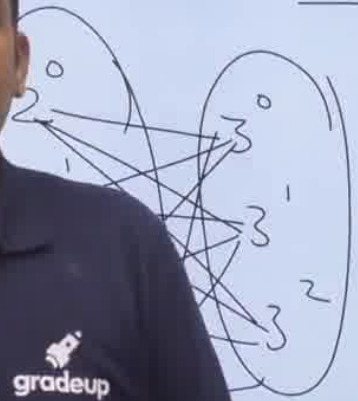
$2^0 \cdot 3^2 = 9$

$2^1 \cdot 3^0 = 2$

$2^1 \cdot 3^1 = 6$

$2^1 \cdot 3^2$

$72 \Rightarrow 2^3 3^2$



4×3

$= 12$ Factors

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Reason of Formula

$2^0 3^0 = 1$

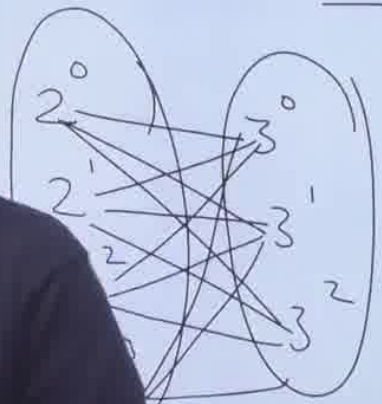
$2^0 3^1 = 3$

$2^0 3^2 = 9$

$2^1 3^0 = 2$

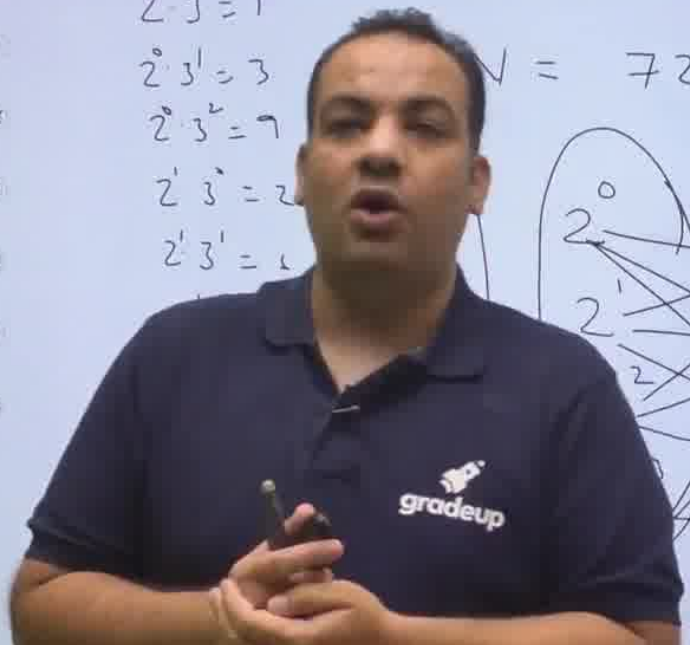
$2^1 3^1 = 6$

$N = 72 \Rightarrow 2^3 3^2$



4×3

$= 12$ Factors



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HOW TO CALCULATE FACTORS OF A NUMBER

$N = 120$

2	120
2	60
2	30
3	
	1

$120 = 2^3 \cdot 3^1 \cdot 5^1$

$(3+1)(1+1)(1+1)$

$4 \cdot 2 \cdot 2$

$= 16$ Factors

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HOW TO CALCULATE FACTORS OF A NUMBER

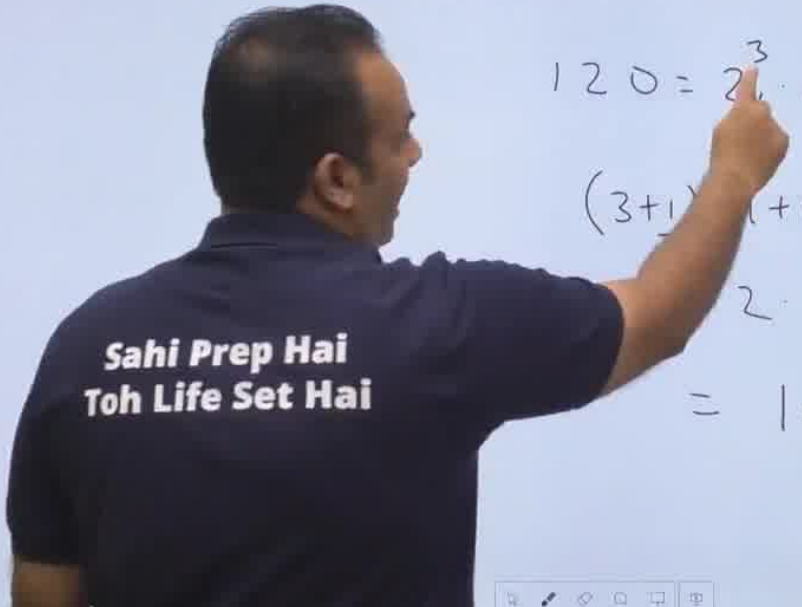
$N = 120$

$120 = 2^3 \cdot 3^1 \cdot 5^1$

$(3+1)(1+1)(1+1)$

$2 \cdot 2 \cdot 2$

$= 16$ Factors



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HOW TO CALCULATE FACTORS OF A NUMBER

$N = 120$

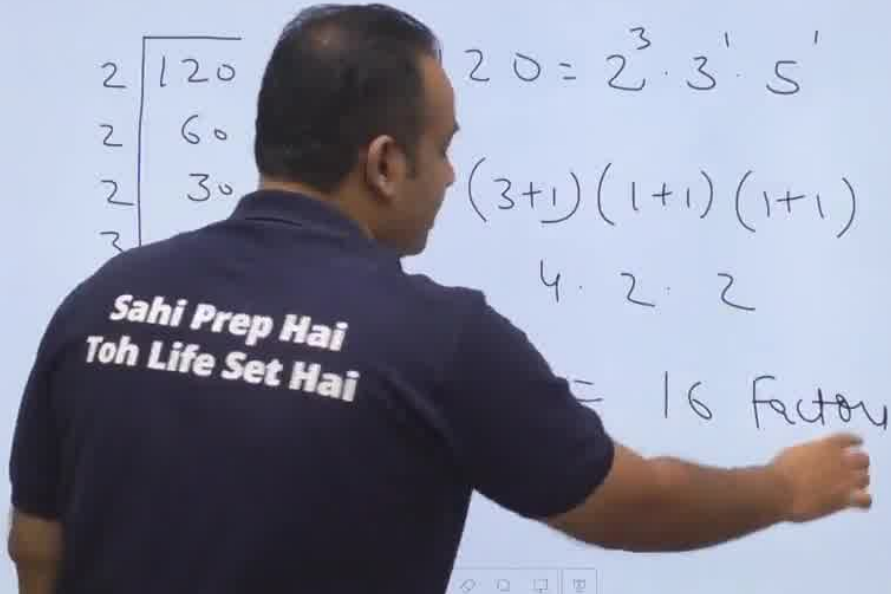
2	120
2	60
2	30
3	

$120 = 2^3 \cdot 3^1 \cdot 5^1$

$(3+1)(1+1)(1+1)$

$4 \cdot 2 \cdot 2$

$= 16$ Factors



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$$72 = 2^3 \cdot 3^2$$

No. of Factors of 72 $\Rightarrow$ $4 \cdot 3$

$\Rightarrow$ 12

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If a number is of the form

$N = P_1^a \cdot P_2^b \cdot P_3^c \ldots\ldots\ldots\ldots\ldots$

No. of factors = $(a + 1) \cdot (b + 1) \cdot (c + 1)\ldots\ldots$

P_1, P_2, P_3 are distinct prime numbers
a, b and c are their exponents.

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Reason of Formula

$2^0 \cdot 3^0 = 1$

$2^0 \cdot 3^1 = 3$

$2^0 \cdot 3^2 = 9$

$2^1 \cdot 3^0 = 2$

$2^1 \cdot 3^1 = 6$

$2^1 \cdot 3^2 = 18$

$2^2 \cdot 3^0 = 4$

$2^2 \cdot 3^1 = 12$

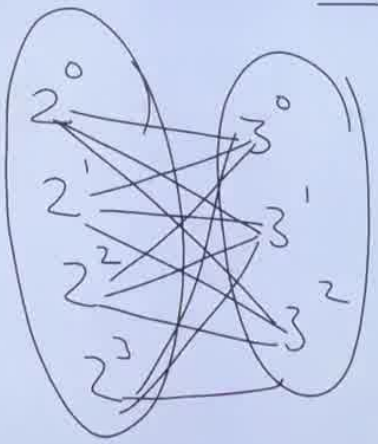
$2^2 \cdot 3^2 = 36$

8

24

72

$N = 72 \Rightarrow 2^3 3^2$



4×3

$= 12$ Factors

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Find the Number of factors of

(i) 720

(ii) $2^3 3^4 5^6$

(iii) $2^9 3^8 4^7 5^6 6^5$

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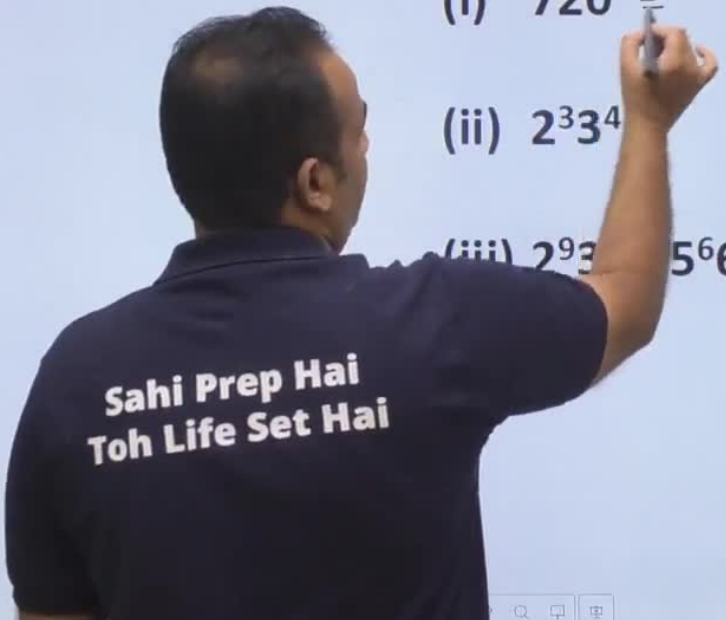
Find the Number of factors of

(i) 720

(ii) $2^3 3^4$

(iii) $2^9 \ldots 5^6 6^5$



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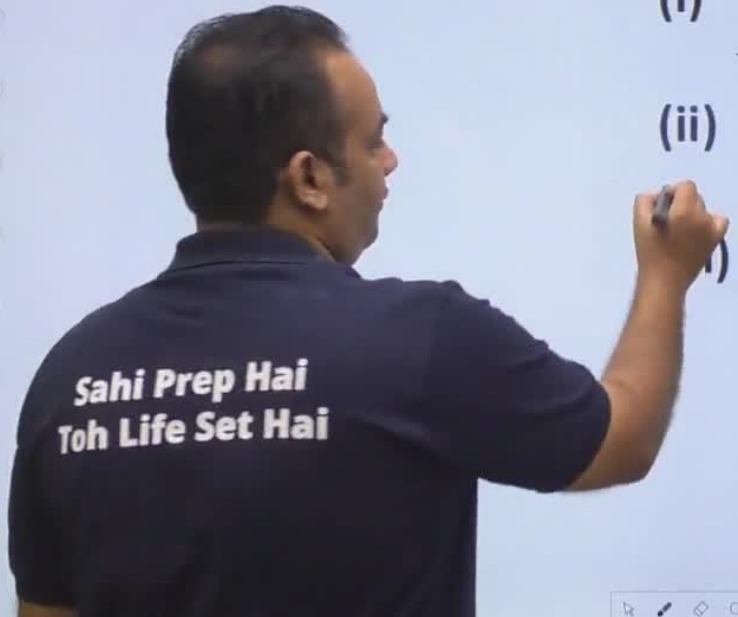
Find the Number of factors of

(i) $720 = 2^4 \cdot 3^2 \cdot 5^1$

$\longrightarrow 5 \cdot 3 \cdot 2 = 30$ ✓

(ii) $2^3 3^4 5^6$

(iii) $2^9 3^8 4^7 5^6 6^5$



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Find the Number of factors of

(i) **720** $= 2^4 \cdot 3^2 \cdot 5^1$

$\longrightarrow 5 \cdot 3 \cdot 2 = 30$ ✓

(ii) $2^3 3^4 5^6$

$\longrightarrow 4 \cdot 5 \cdot 7 = 140$ ✓

(iii) $2^9 3^8 4^7 5^6 6^5$

$2^9 3^8 4^7 5^6 6^5$

$9 \quad 8 \quad (2^2)^7 \quad 5^6 \quad (2^1 3^1)^5$

$= 5^6 \; 2^{14} \; 3^5$

$= 3^{13} \; 5^6$

$\times 14 \times 7$

gradeup

$2^9 3^8 4^7 5^6 6^5$

$2^9 3^8 (2^2)^7 5^6 (2^1 3^1)^5$

$2^9 3^8 2^{14} 5^6$

Find the Number of factors of

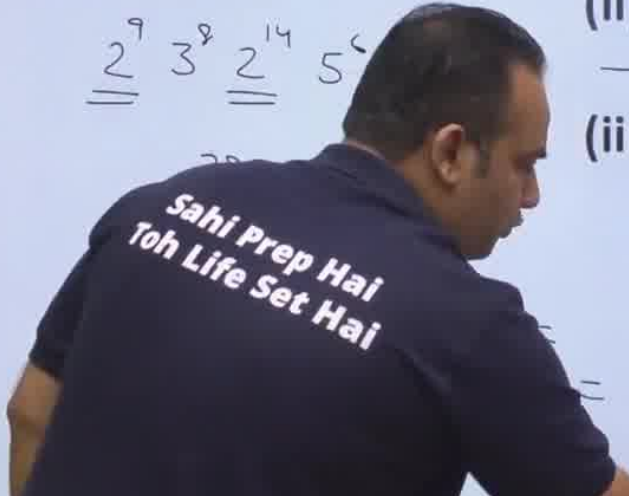
(i) **720** $= 2^4 \cdot 3^2 \cdot 5^1$

$\longrightarrow 5 \cdot 3 \cdot 2 = 30$ ✓

(ii) $2^3 3^4 5^6$

$\longrightarrow 4 \cdot 5 \cdot 7 = 140$ ✓

(iii) $2^9 3^8 4^7 5^6 6^5$



29×98

$= 29($

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How to Calculate Odd Factors of a Number

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How to Calculate Odd Factors of a Number

gradeup

$2^9 3^8 4^7 5^6 6^5$

$2^9 3^8 (2^2)^7 5^6 (2^1 3^1)^5$

$2^9 3^8 2^{14}$

Find the Number of factors of

(i) **720** $= 2^4 \cdot 3^2 \cdot 5^1$

$\longrightarrow 5 \cdot 3 \cdot 2 = 30$ ✓

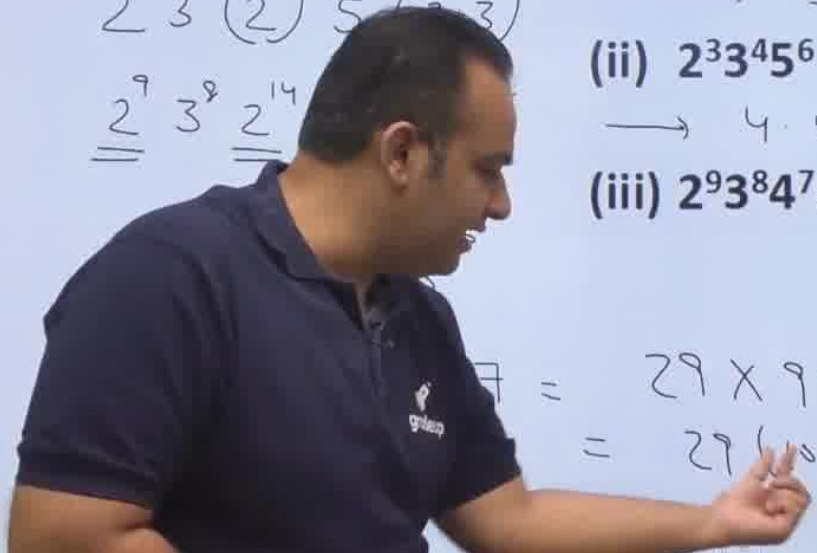
(ii) $2^3 3^4 5^6$

$\longrightarrow 4 \cdot 5 \cdot 7 = 140$ ✓

(iii) $2^9 3^8 4^7 5^6 6^5$

$= 29 \times 98$

$= 29(100-2) = 2842$



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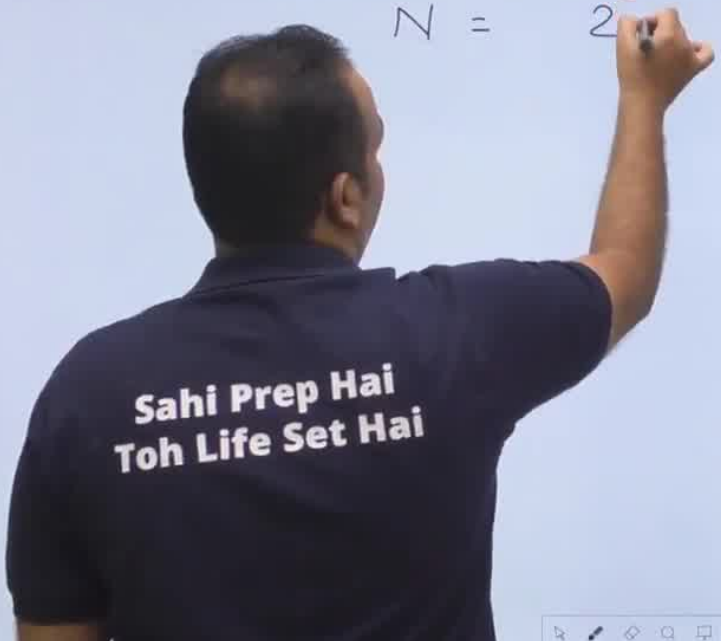
How to Calculate Odd Factors of a Number

$N = 2^{3}$



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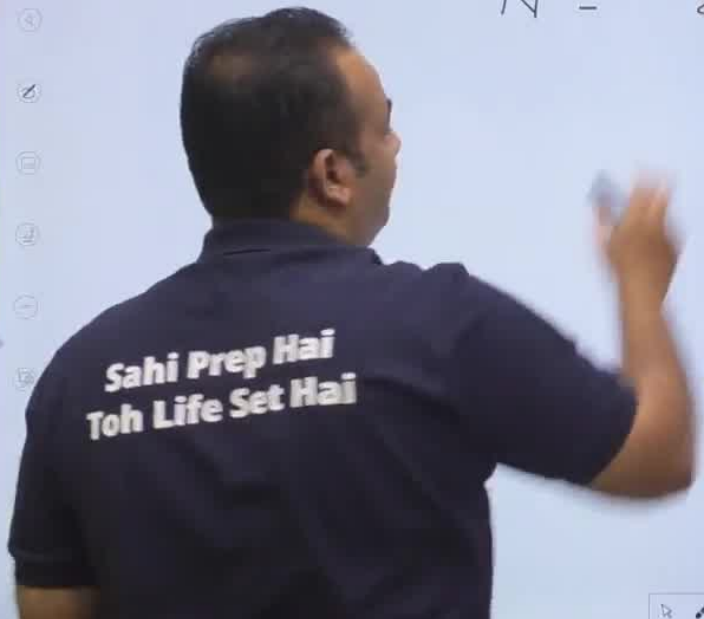
How to Calculate Odd Factors of a Number

$N = 2^3 \cdot 3^2 \Rightarrow 72$



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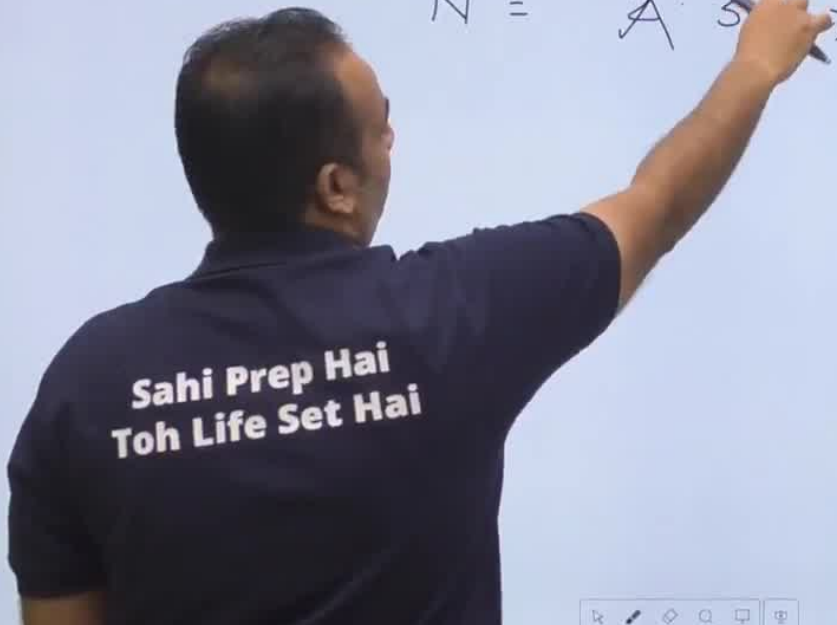
How to Calculate Odd Factors of a Number

$N = 2^3 \times 3^2 \times 7 \quad 72$



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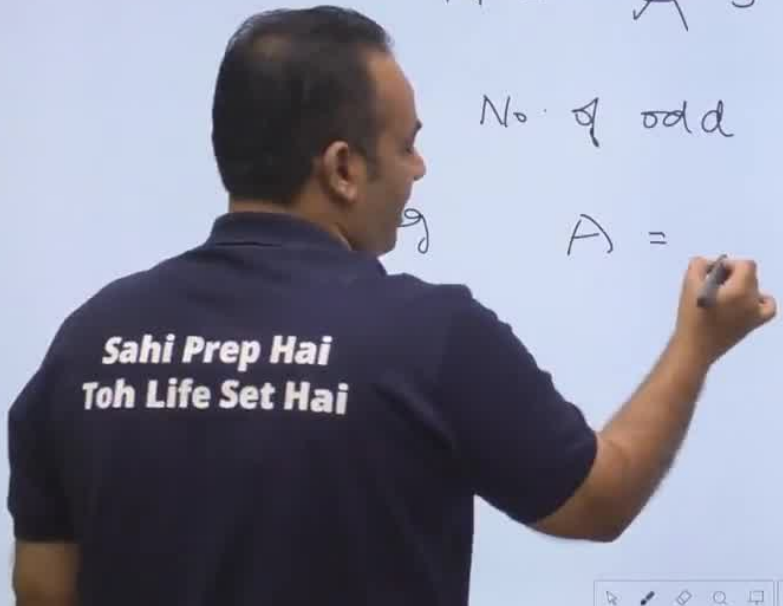
How to Calculate Odd Factors of a Number

$N = 2^3 \cdot 3^2 \Rightarrow 72$

No. of odd Factors $\rightarrow$ 3

e.g. A =



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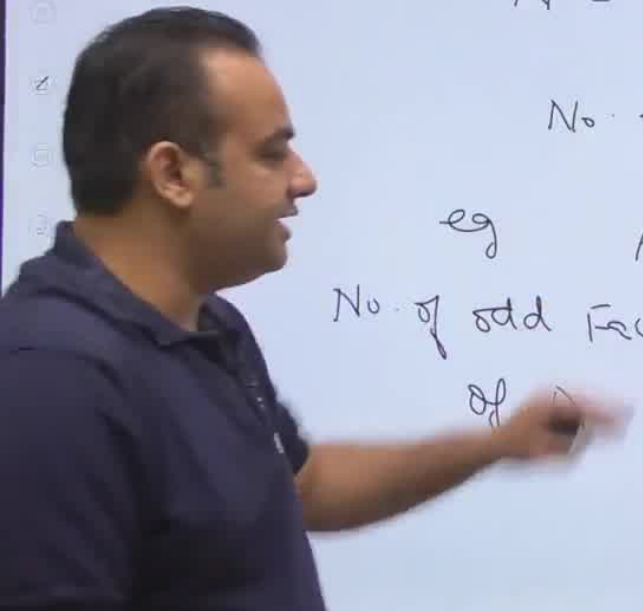
How to Calculate Odd Factors of a Number

$N = 2^3 \cdot 3^2 \Rightarrow 72$

No. of odd Factors $\rightarrow$ 3

eg $A = 2^5 3^8 5^7$

No. of odd Factors of A =



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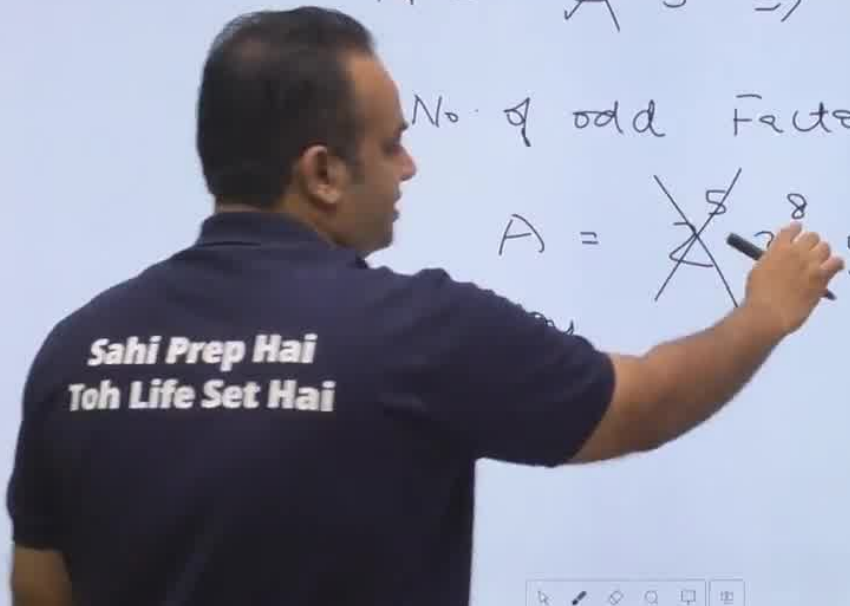
How to Calculate Odd Factors of a Number

$N = 2^3 \times 3^2 \Rightarrow 72$

No of odd Factors $\rightarrow 3$

$A = 2^8 \times 5^7$



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How to Calculate Odd Factors of a Number

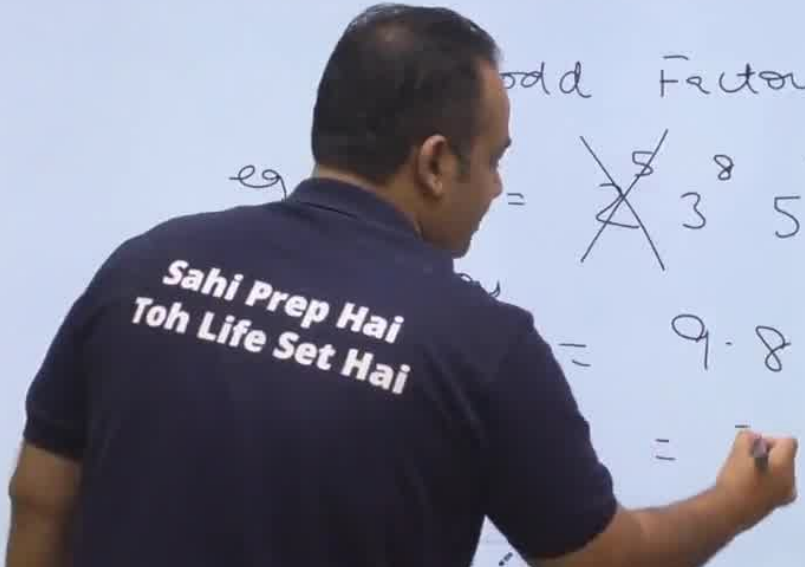
$N = \cancel{2^3} \cdot 3^2 \Rightarrow 72$

Odd Factors $\rightarrow$ 3

eg $= \cancel{2^8} \cdot 3^8 \cdot 5^7$

$= 9 \cdot 8$

$=$



15
16
17

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How to Calculate Odd Factors of a Number

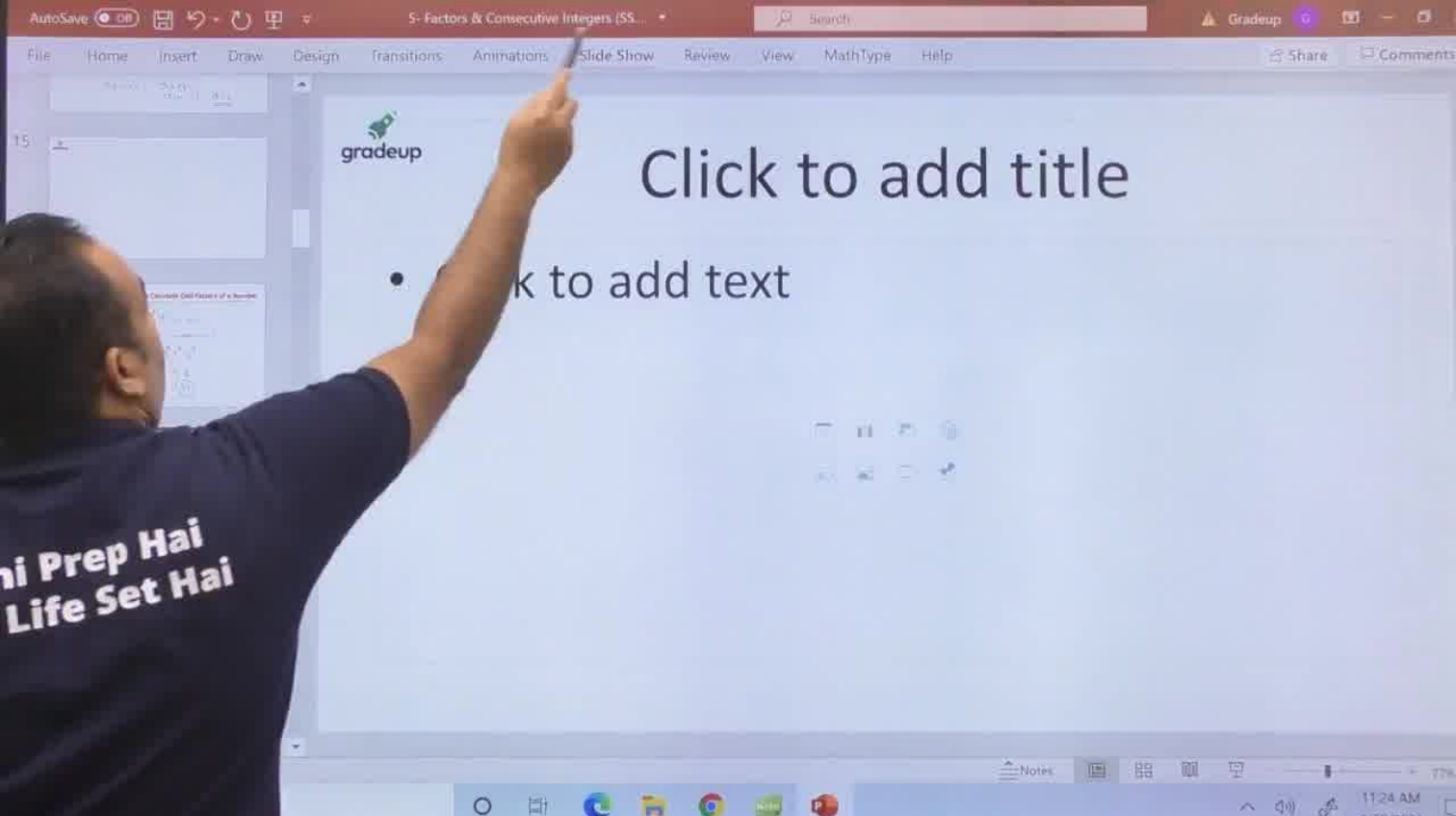
$N = \cancel{2^3} \; 3^2 \Rightarrow 72$

odd Factors → 3

eg $A = \cancel{2^5} \; 3^8 \; 5^7$

No of odd Factors of A $= 9 \cdot 8$

$= 72$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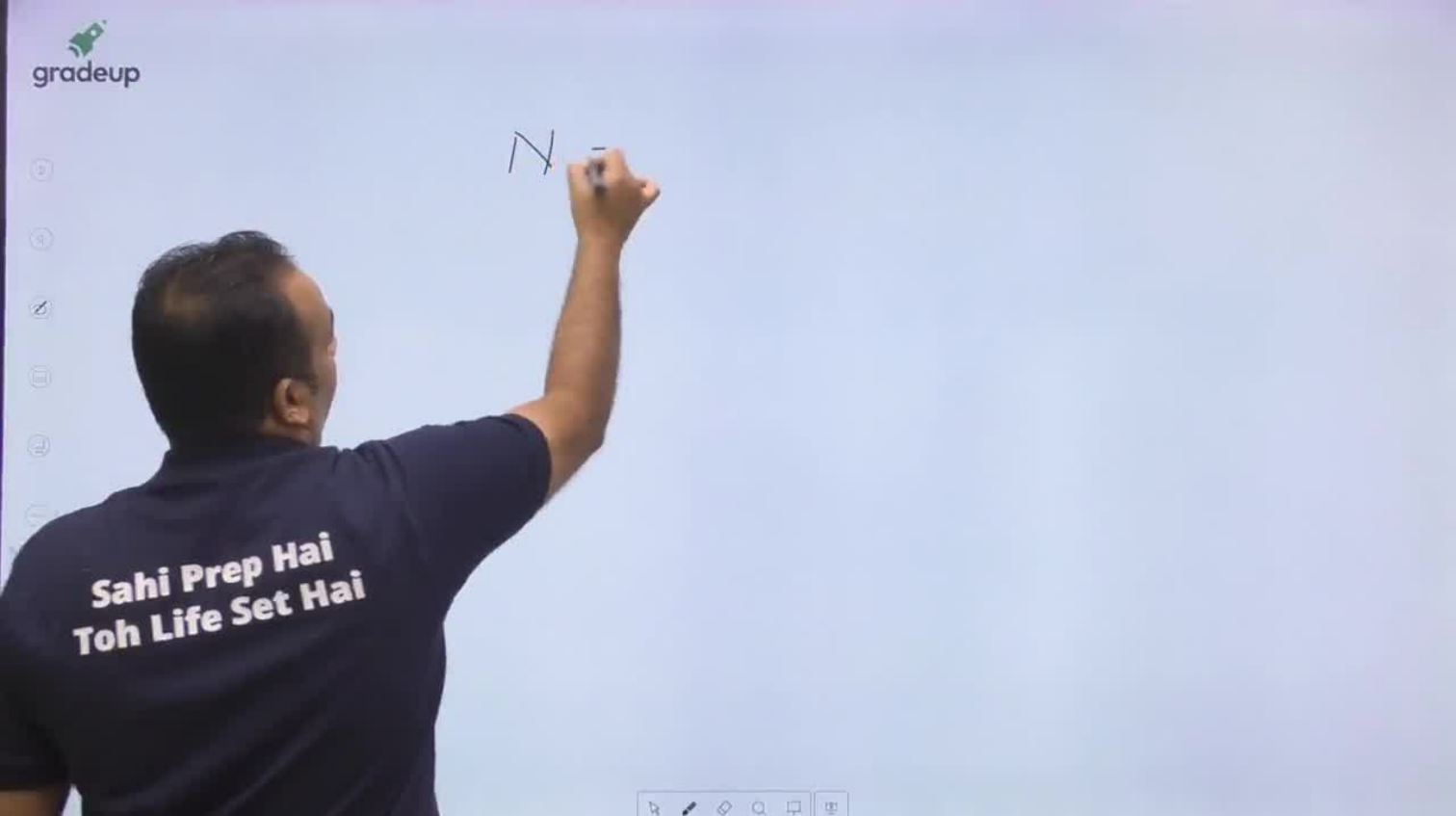
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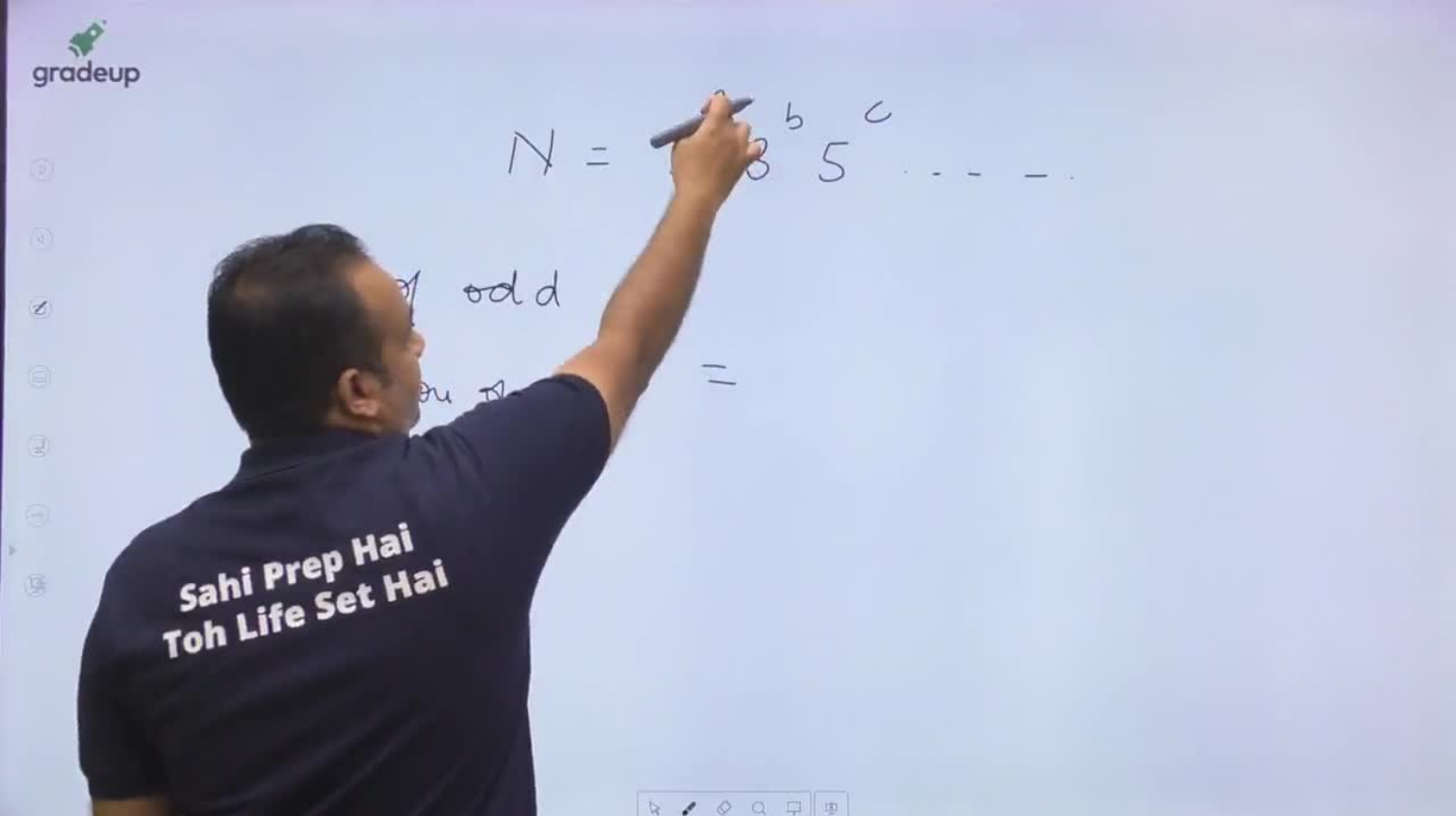
Toh Life Set Hai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N = 3^b 5^c . . . .
odd
=
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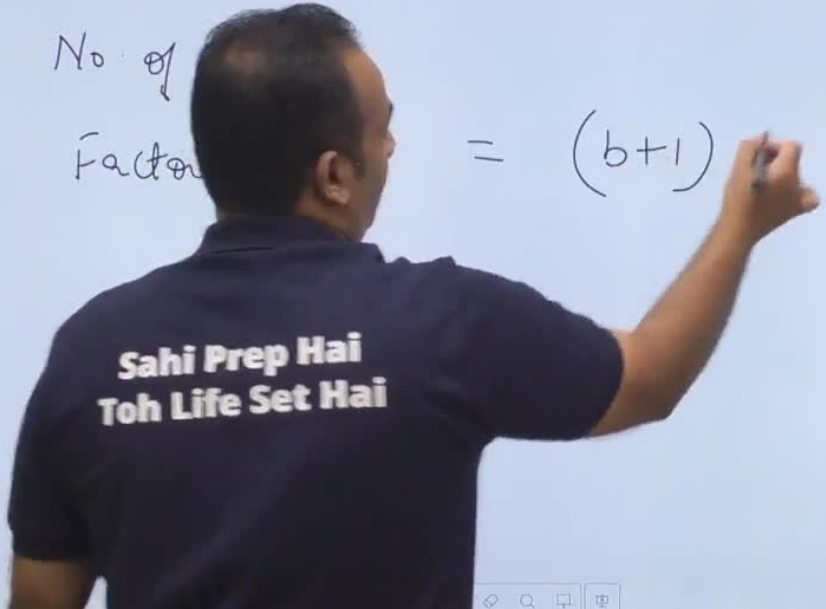
$$N = 2^{a} 3^{b} 5^{c} \ldots$$

No of

Factors $= (b+1)$



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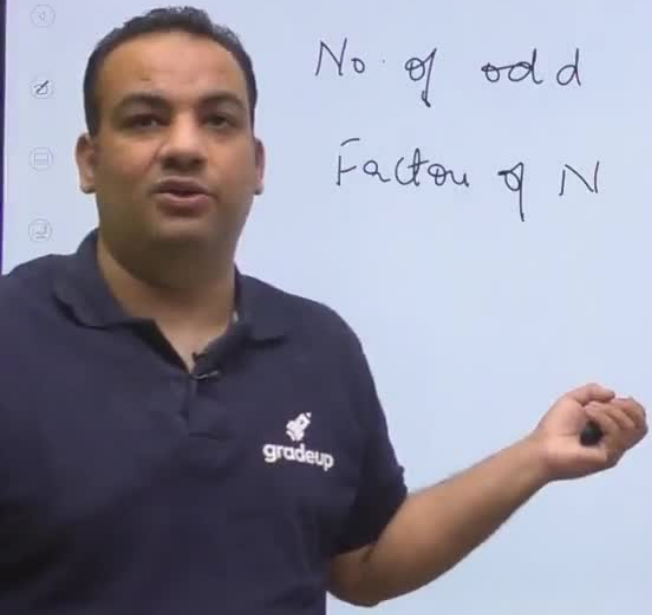
$$N = 2^{a} 3^{b} 5^{c} \ldots$$

No of odd Factors of $N = (b+1)(c+1)\ldots$



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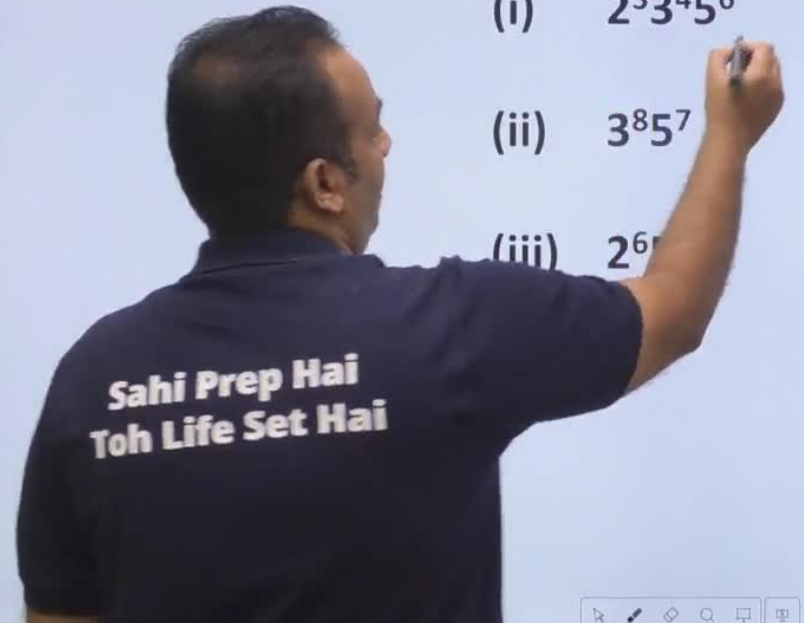
Find the Number of odd factors of

(i) $2^3 3^4 5^6$

(ii) $3^8 5^7$

(iii) 2^6



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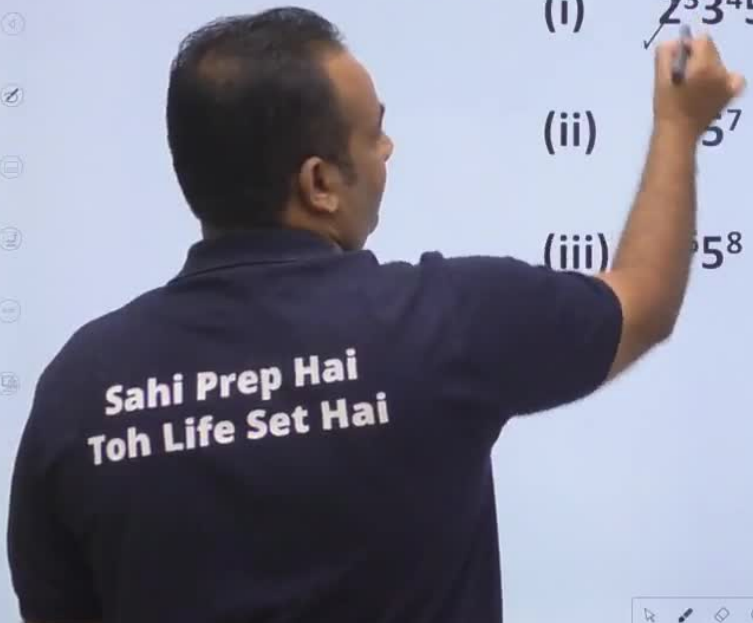
Find the Number of odd factors of

(i) $2^3 3^4 5^6$ →

(ii) 5^7

(iii) 5^8



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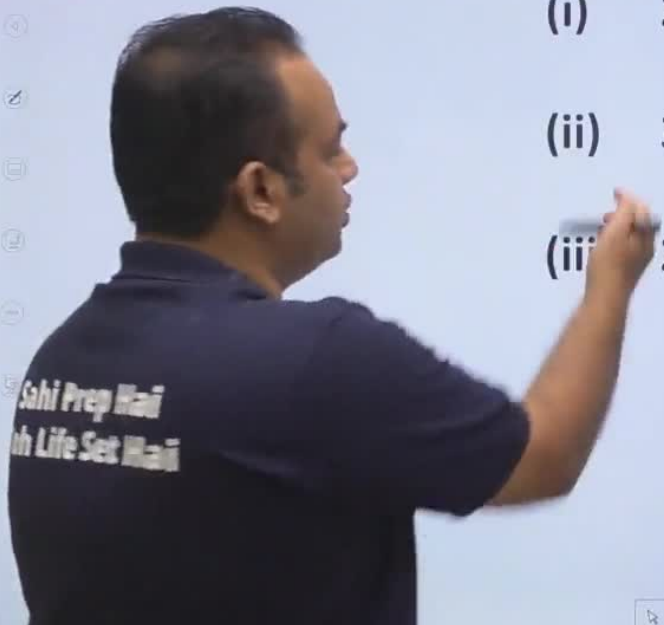
Find the Number of odd factors of

(i) $2^3 3^4 5^6$ ⟶ $5 \cdot 7 = 35$

(ii) $3^8 5^7$

(iii) $2^6 5^8$



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How to Calculate Even Factors of a Number

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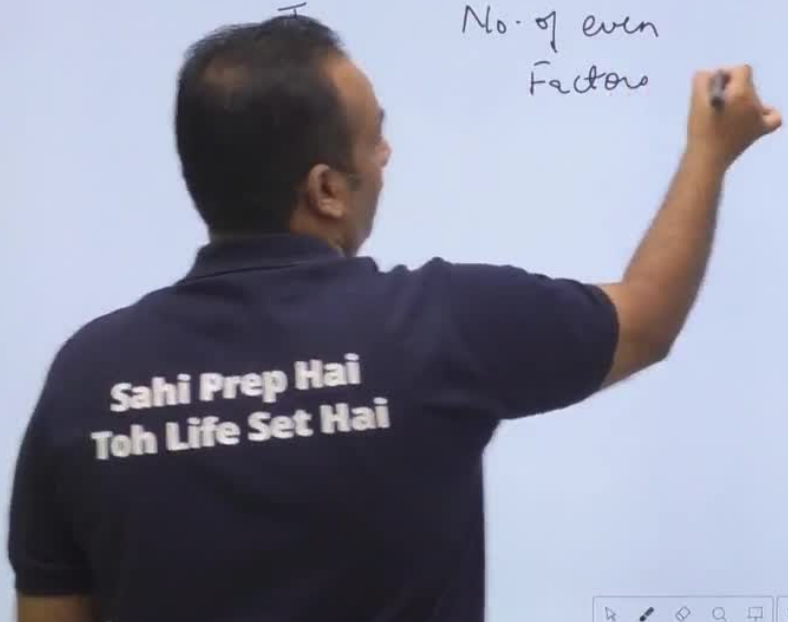
How to Calculate Even Factors of a Number

No. of even
Factors



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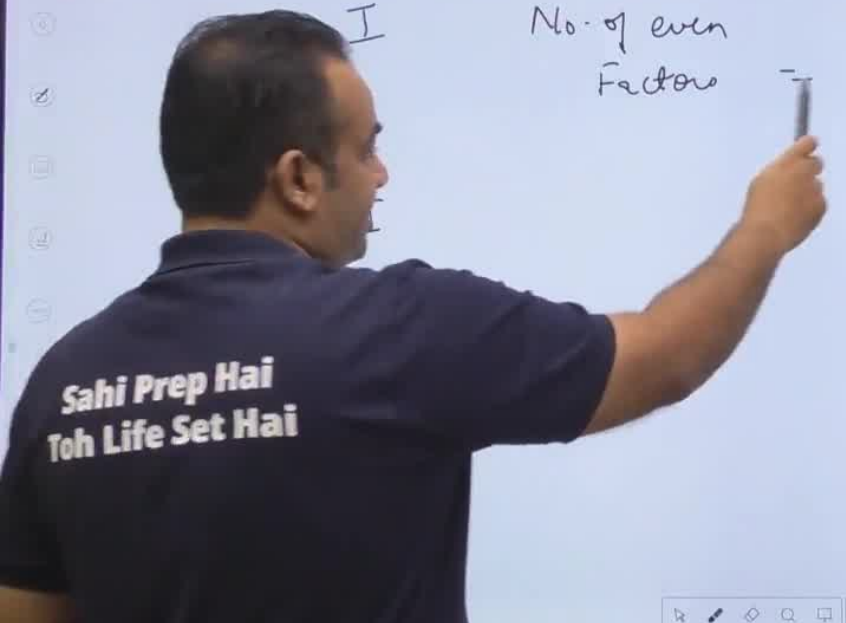
How to Calculate Even Factors of a Number

I

No. of even Factors =

Total Factors − Odd Factors



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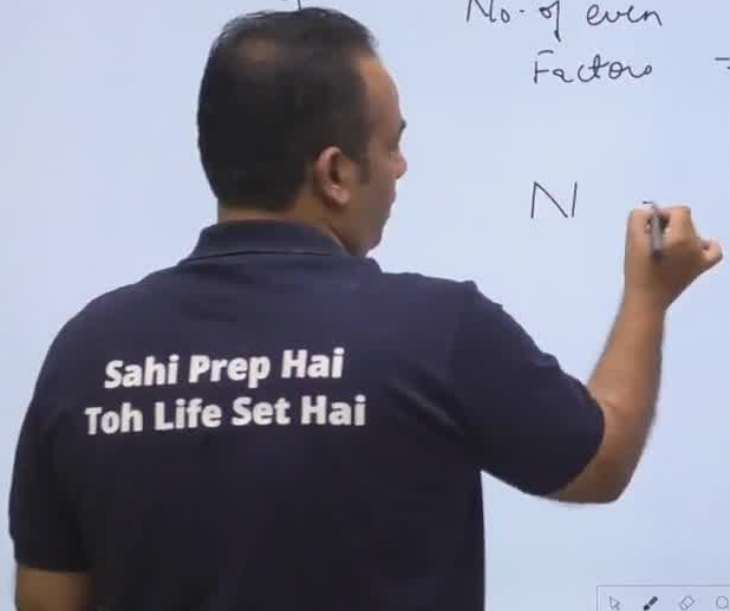
How to Calculate Even Factors of a Number

No. of even Factors = Total Factors − Odd Factors

N



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How to Calculate Even Factors of a Number

I

No. of even Factors = Total Factors − Odd Factors

$N = 2^3 3^4 5^6$

Total Factors

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Toh Life Set Hai

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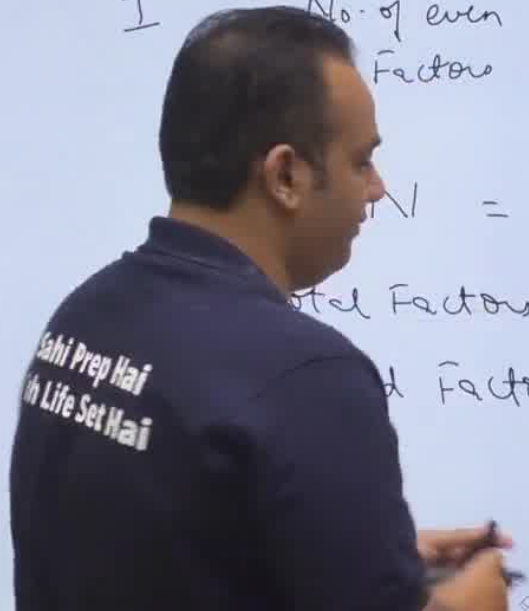
How to Calculate Even Factors of a Number

I No. of even Factors = Total Factors − Odd Factors

$N = 2^3 3^4 5^6$

Total Factors → 4 · 5 · 7 = 140

Odd Factors →



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How to Calculate Even Factors of a Number

I No. of even Factors = Total Factors − Odd Factors

$N = 2^3 3^4 5^6$

Total Factors → 4 · 5 · 7 = 140

Odd Factors → 5 · 7 = 35

Even Fa

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How to Calculate Even Factors of a Number

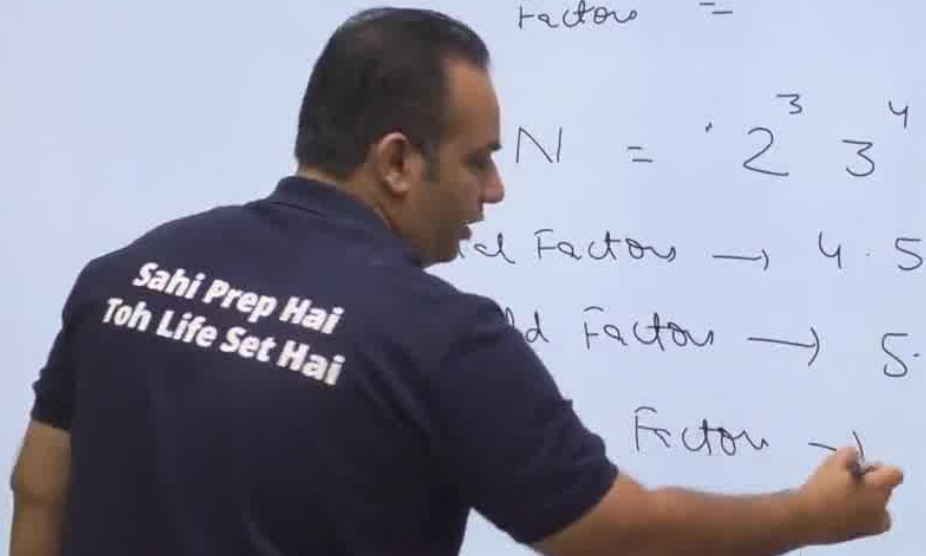
I No. of even Factors = Total Factors − Odd Factors

$N = 2^3 3^4 5^6$

Total Factors → 4 · 5 · 7 = 140

Odd Factors → 5 · 7 = 35

Even Factors →



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How to Calculate Even Factors of a Number

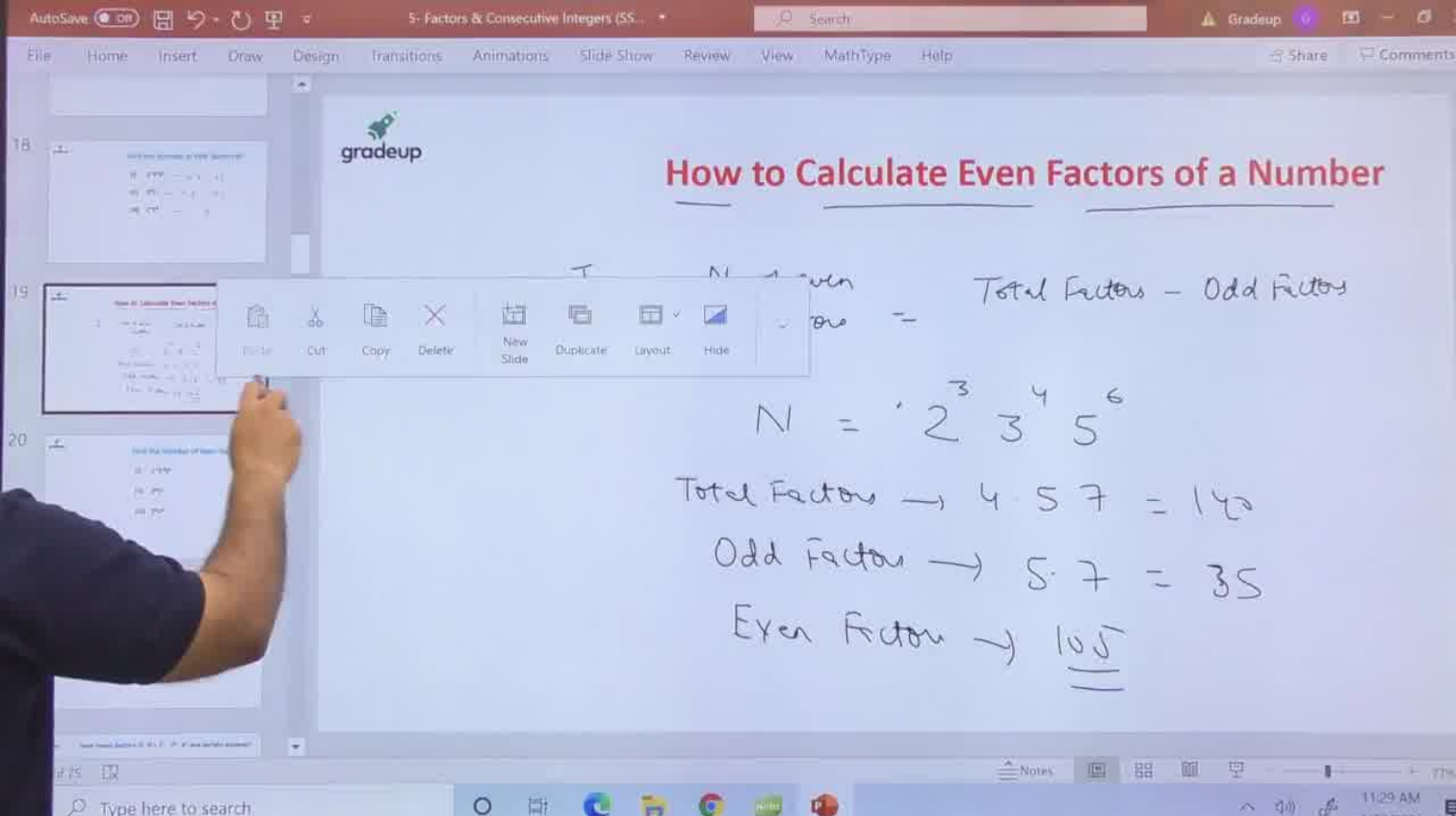
I No. of even Factors = Total Factors − Odd Factors

$$N = 2^3 3^4 5^6$$

Total Factors → 4 · 5 · 7 = 140

Odd Factors → 5 · 7 = 35

Even Factors → 105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N = 2^3 3^4 5^6
Total Factors → 4 5 7 = 140
Odd Factors → 5 7 = 35
Even Factors → 105
Notes
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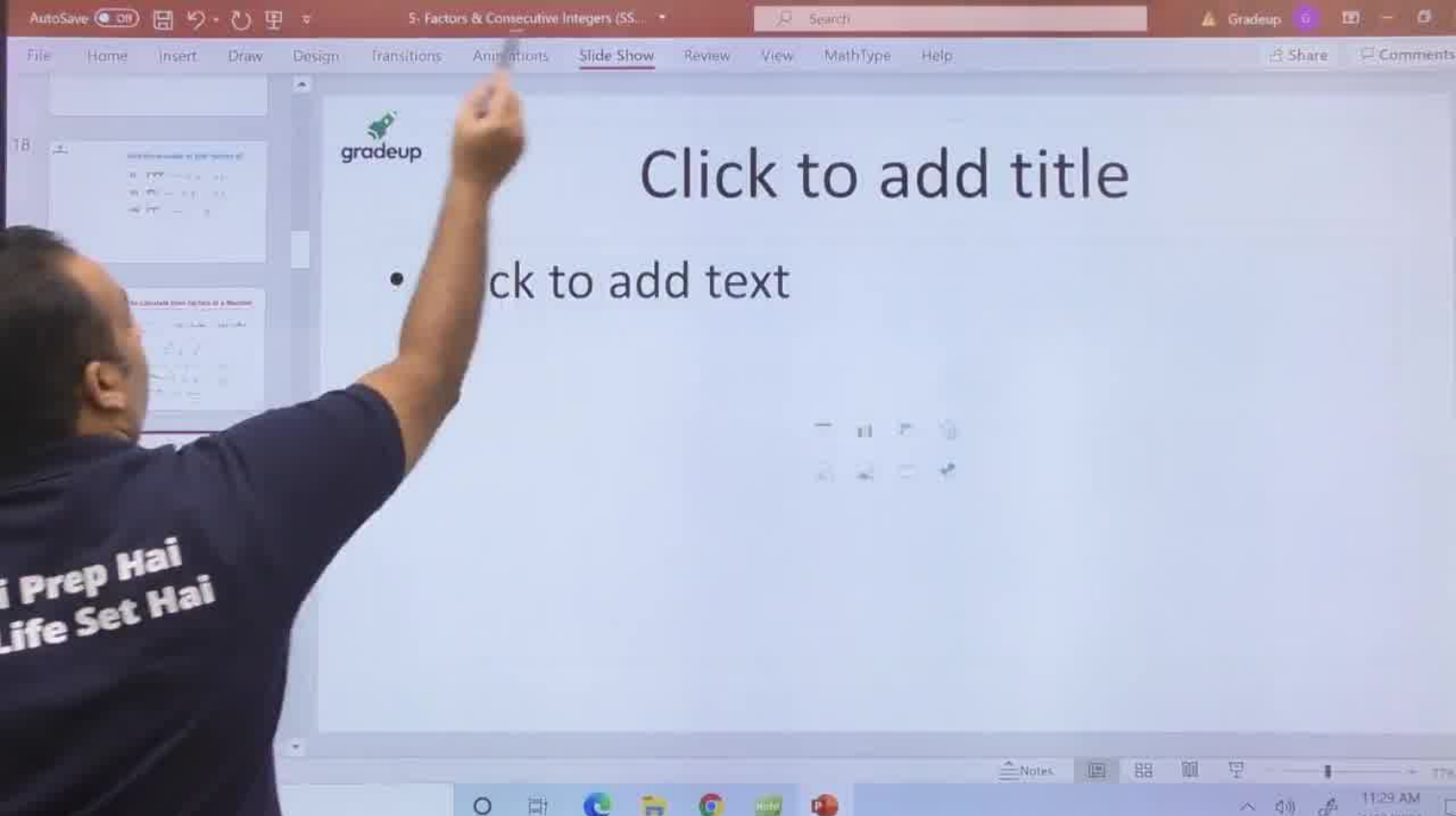
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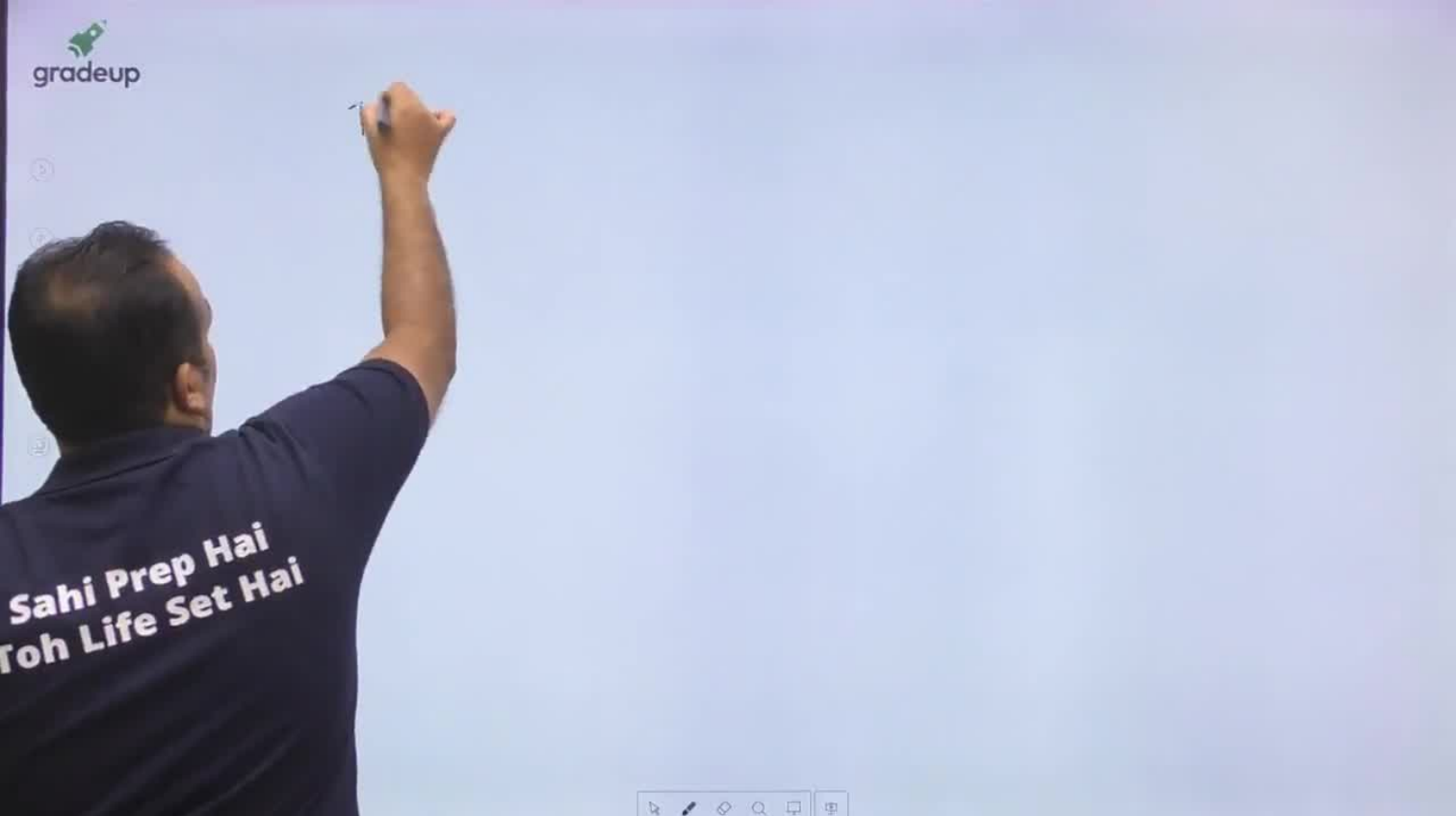
Toh Life Set Hai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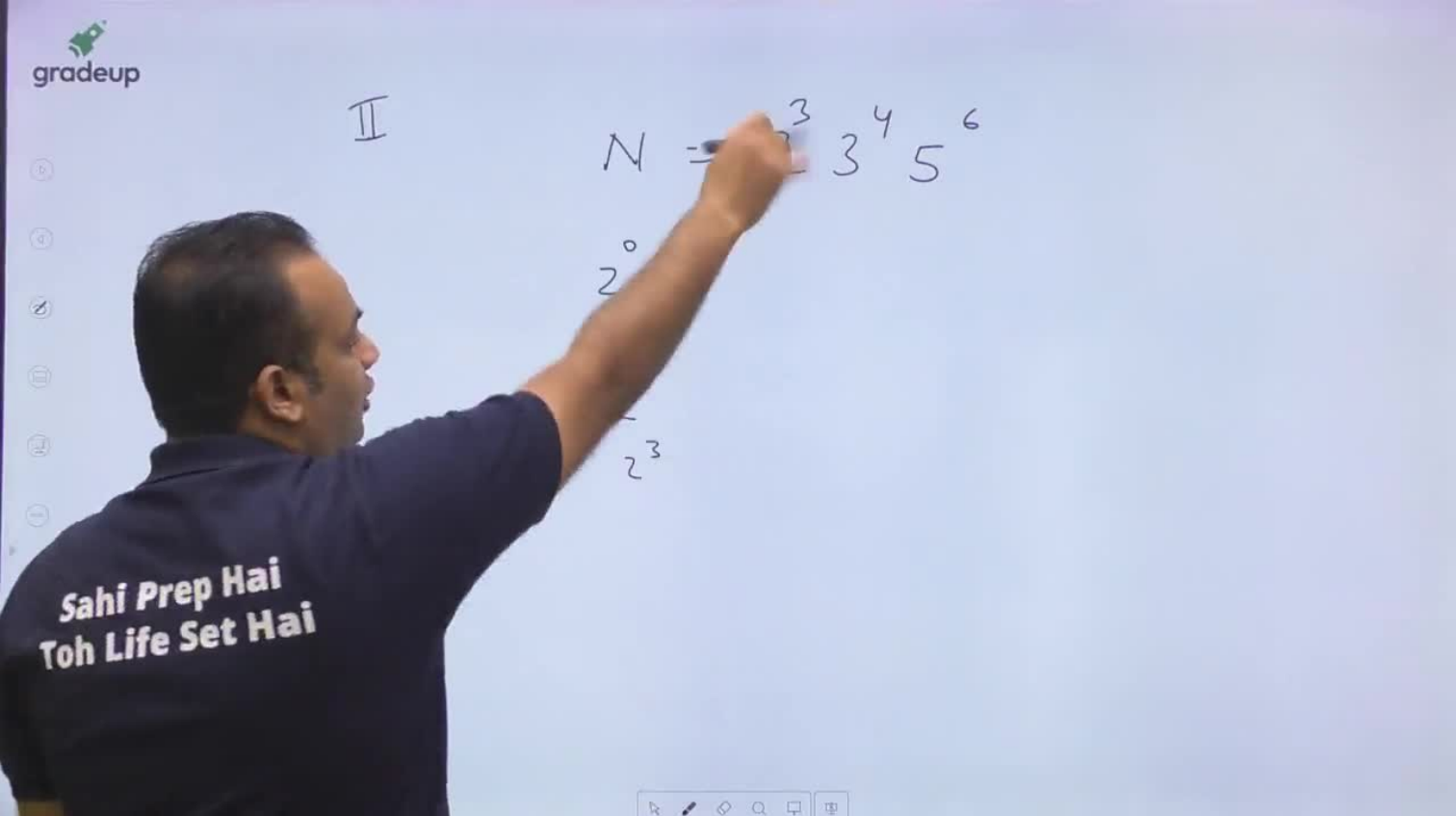
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II
N = 3 4 5 6
2 0
2 3
Sahi Prep Hai
Toh Life Set Hai

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II

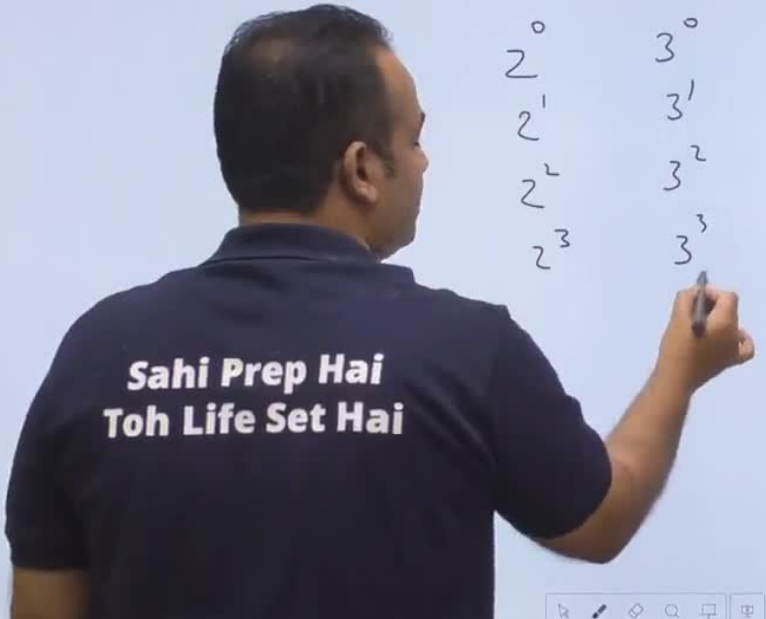
$N = 2^3 3^4 5^6$

2^0 3^0

2^1 3^1

2^2 3^2

2^3 3^3



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II

$N = 2^3 3^4 5^6$

3^0

3^1

3^2

3^3

3^4

5^0

5^1

5^2

5^3

Sahi Prep Hai
Toh Life Set Hai

gradeup

II

$N = 2^3 3^4 5^6$

2^0 ~~2^0~~

2^1

2^2

2^3

3^0

3^1

3^2

3^3

3^4

5^0

5^1

5^2

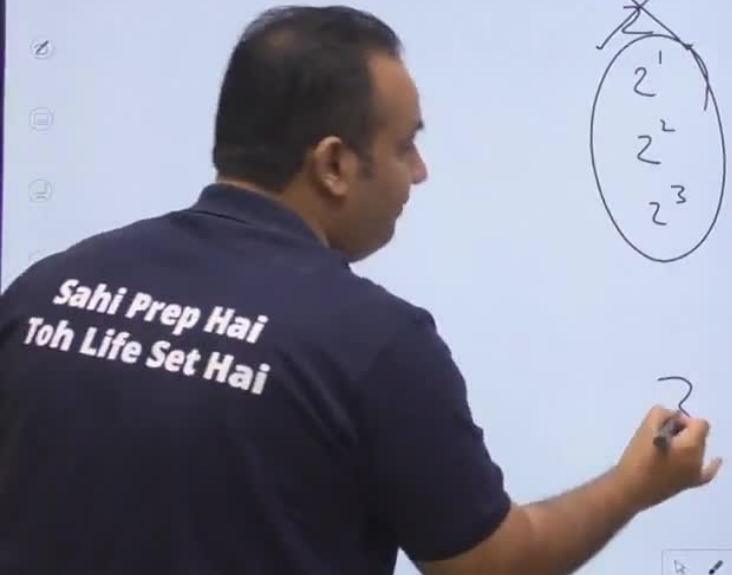
5^3

5^4

5^5

5^6

3



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II

$N = 2^3 3^4 5^6$

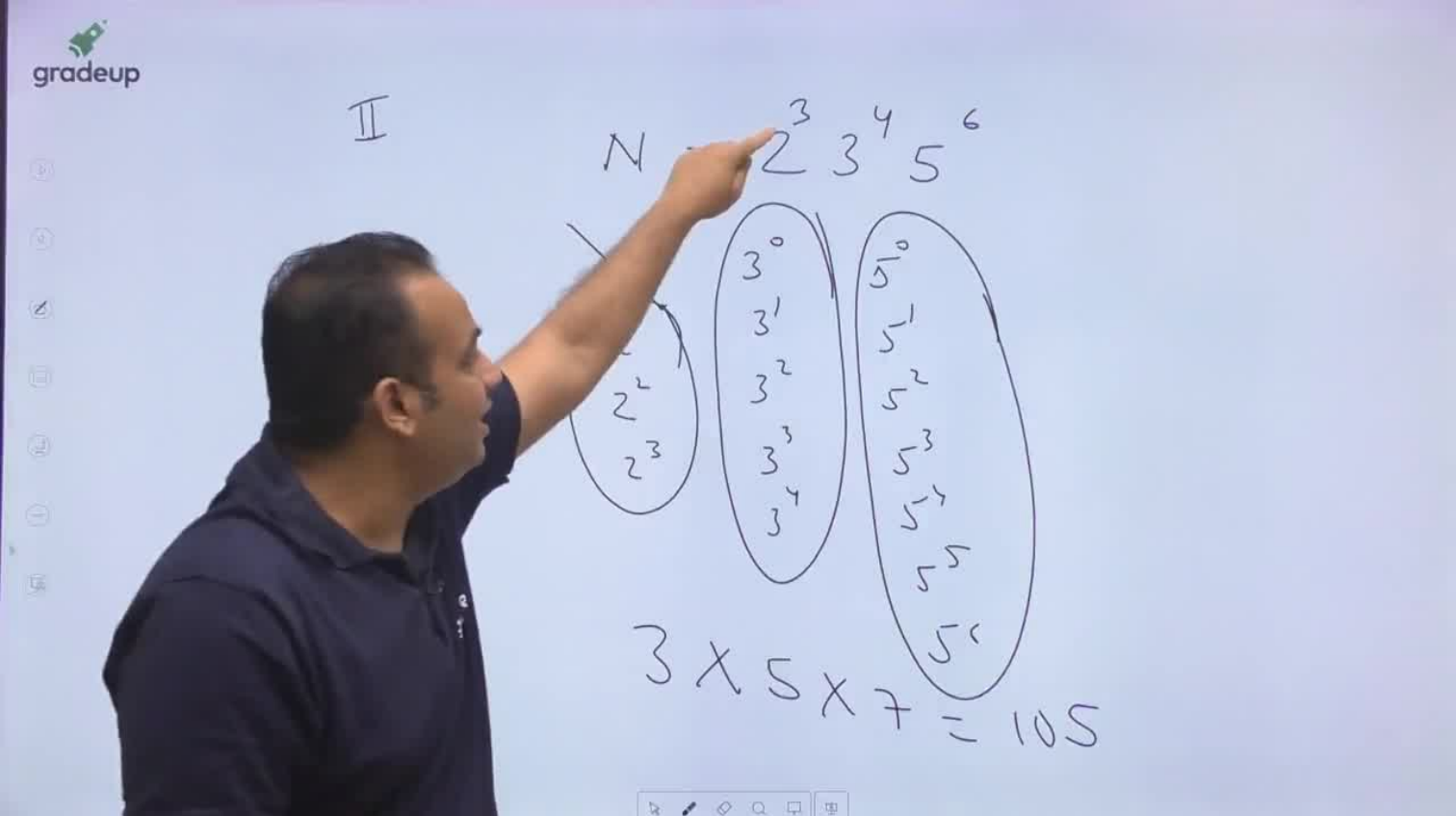
2^0 ~~2^0~~

2^1 2^2 2^3

3^0 3^1 3^2 3^3 3^4

5^0 5^1 5^2 5^3 5^4 5^5 5^6

$3 \times$ -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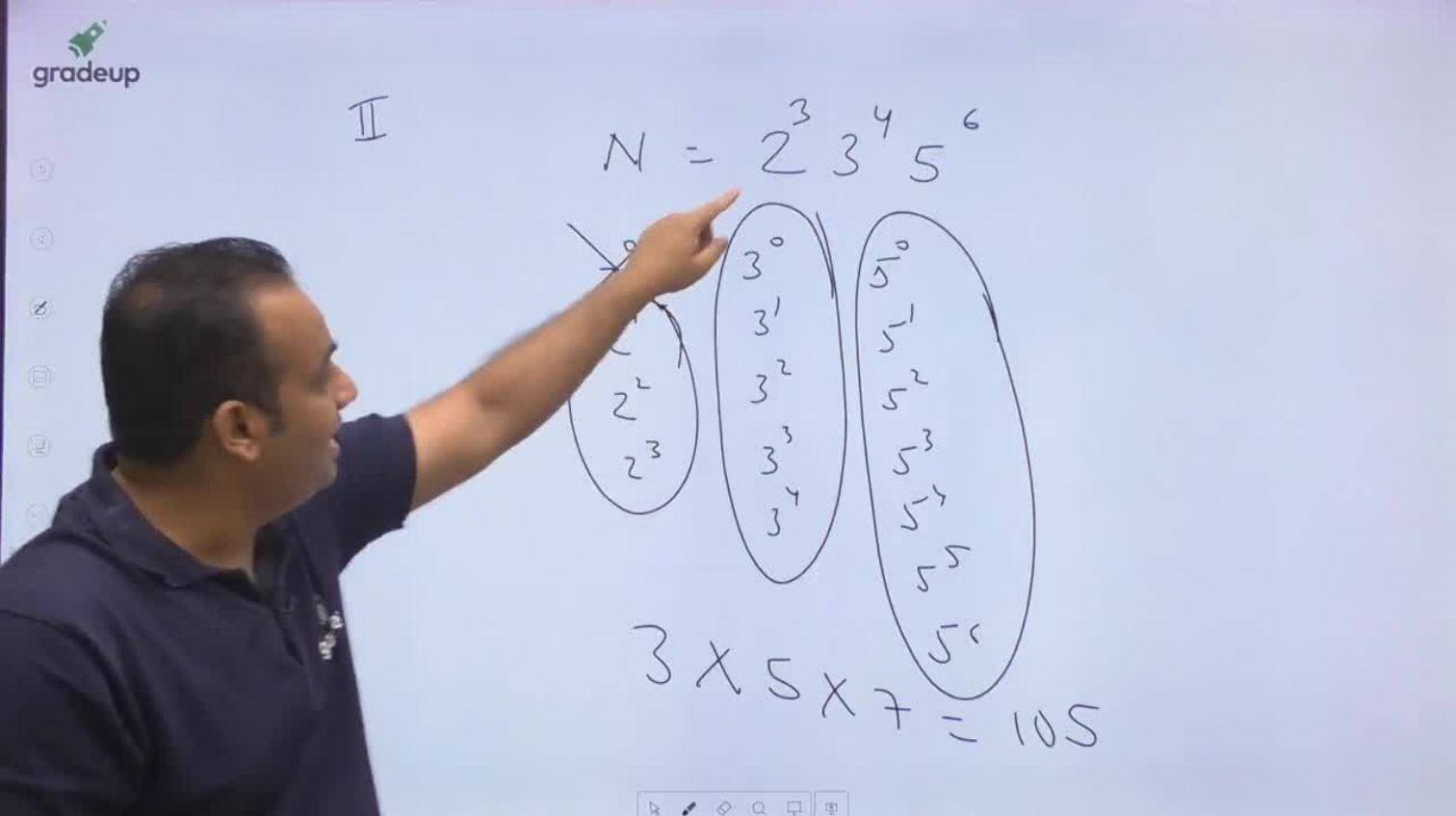
II
N
2 3 4 5 6
2^0 2^1 2^2 2^3
3^0 3^1 3^2 3^3 3^4
5^0 5^1 5^2 5^3 5^4 5^5 5^6
3 x 5 x 7 = 105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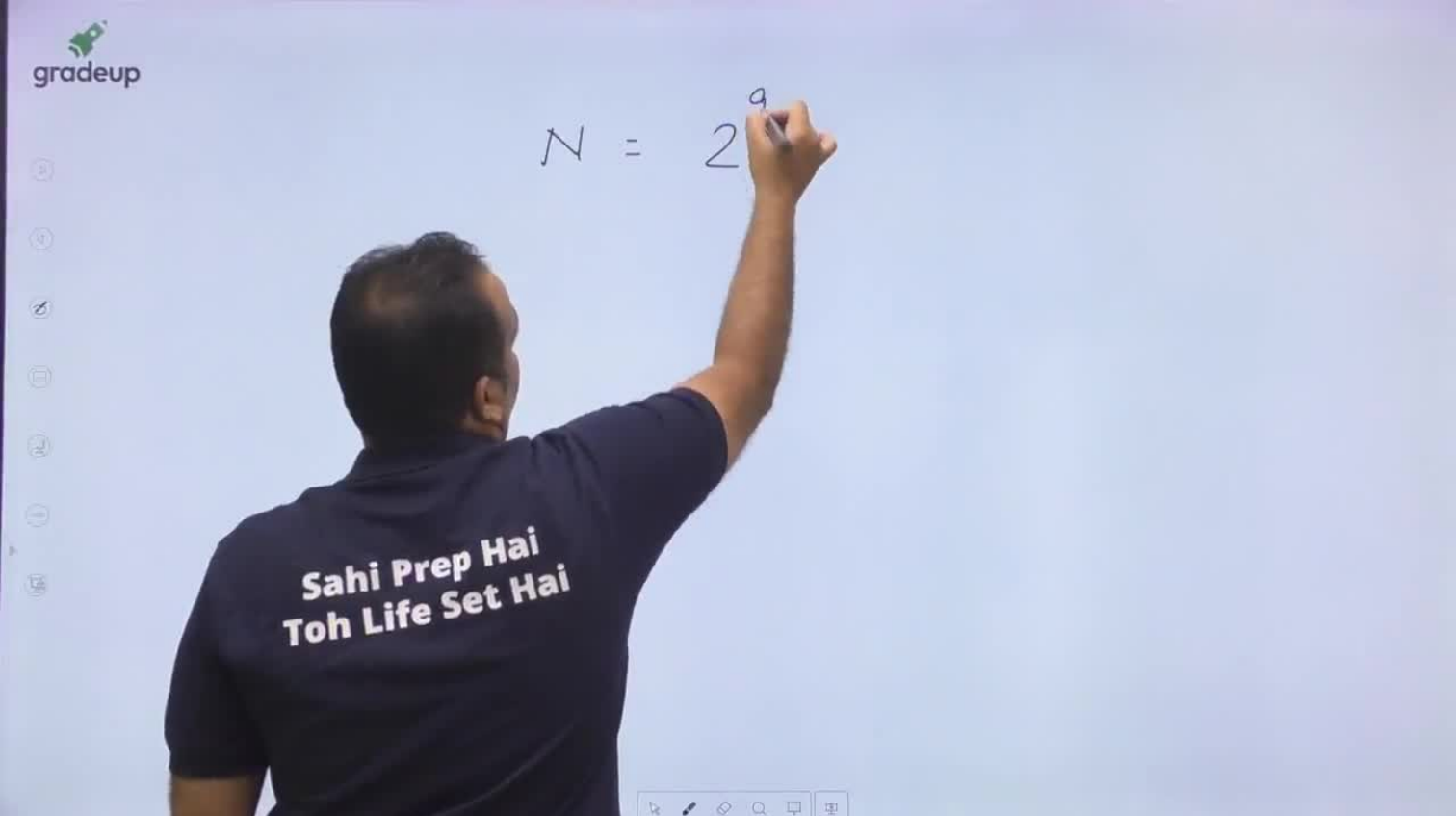
II
N = 2^3 3^4 5^6
3^0
3^1
3^2
3^3
3^4
5^0
5^1
5^2
5^3
5^4
5^5
5^6
2^2
2^3
3 x 5 x 7 = 105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N = 2^9
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Toh Life Set Hai

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$$N = 2^{a} \cdot 3^{b} \cdot 5^{c} \ldots$$

No. of even

Facto

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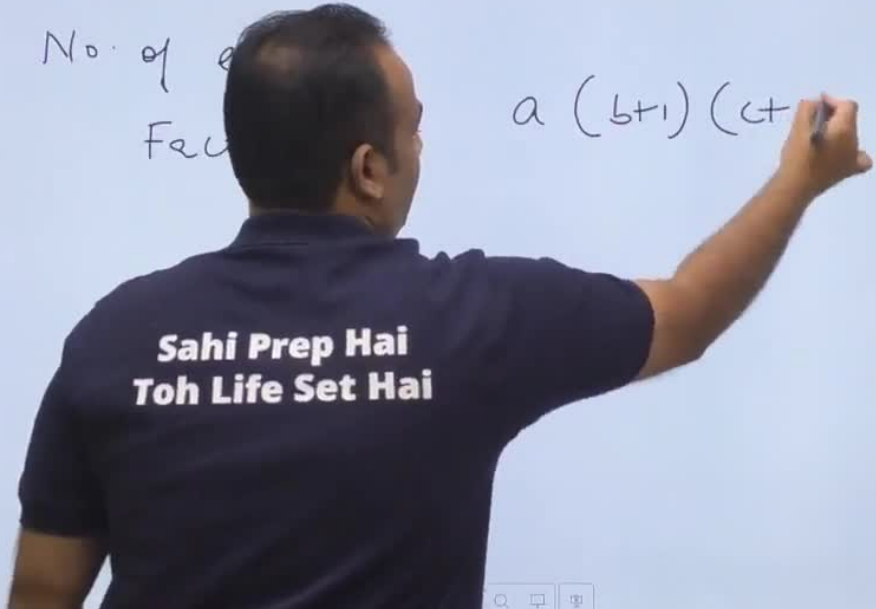
$$N = 2^{a} \cdot 3^{b} \cdot 5^{c} \ldots$$

No. of

Fac

$a(b+1)(c+$



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$$N = 2^{a} \cdot 3^{b} \cdot 5^{c} \ldots$$

even

$= a(b+1)(c+1)\ldots$

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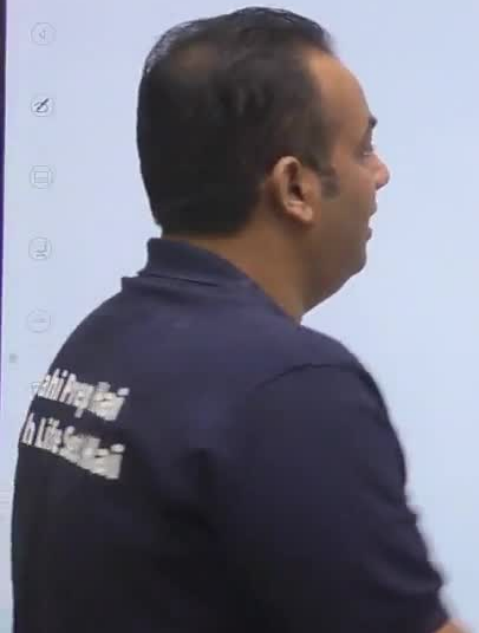
Find the Number of Even factors of

(i) $2^3 3^4 5^6$

(ii) $3^8 5^7$

(iii) $2^6 5^8$



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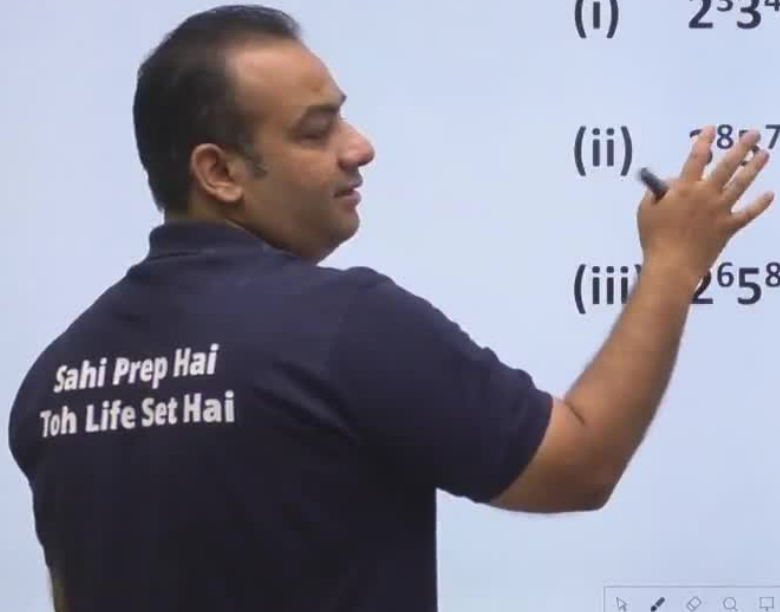
Find the Number of Even factors of

(i) $2^3 3^4 5^6$ → 3 · 5 · 7 = 105

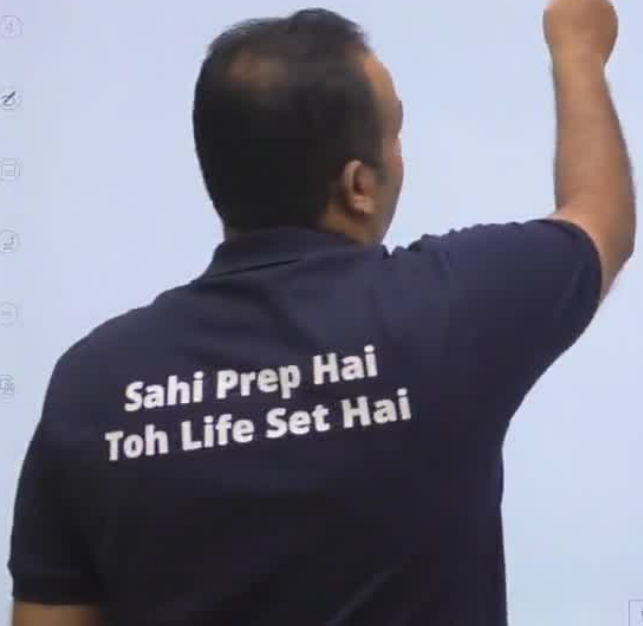
(ii) [illegible]

(iii) $2^6 5^8$



gradeup

Perfect Square



gradeup

Perfect Square

Perfect square = "Square of an integer"

$0^2 = 0$ ✓

$1^2 = 1$ ✓

$2^2 = 4$ ✓

$3^2 = 9$ ✓

$4^2 = 16$ ✓

gradeup

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$1^2 = 1$ —

$2^2 = 4$ —

$3^2 =$

$4^2 =$

is not a perfect square

$P_1^x \cdot P_2^y \cdot P_3^z - - -$

perfect square

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Toh Life Set Hai

gradeup

Perfect Square

Perfect square = "Square of an integer"

$0^2 =$

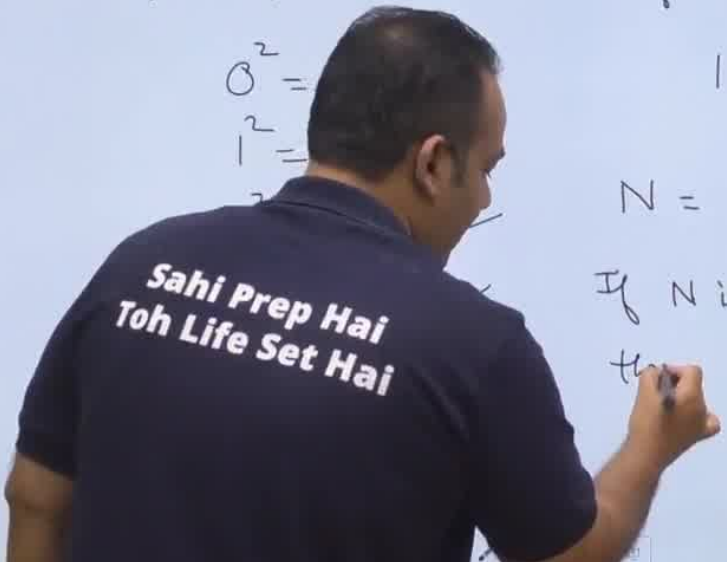
$1^2 =$

18 is not a perfect square

$N = P_1^x \cdot P_2^y \cdot P_3^2 - - -$

If N is a perfect square

th



gradeup

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2^2

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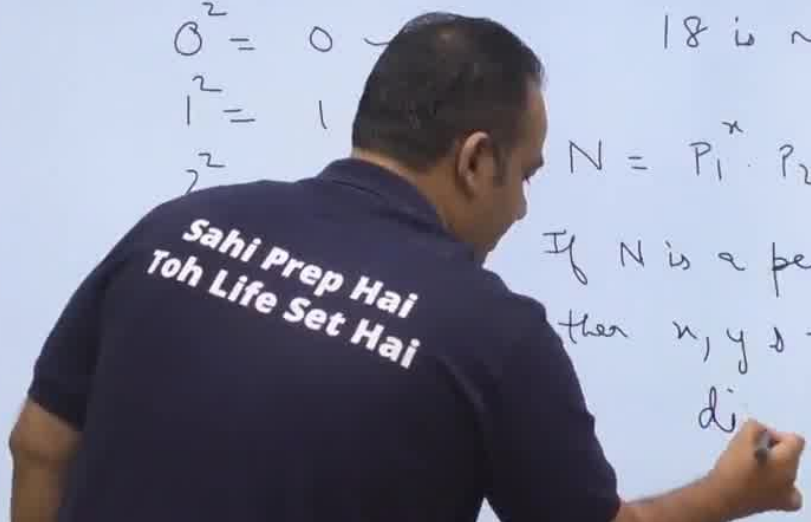
$N = P_1^x \cdot P_2^y \cdot P_3^z - - -$

If N is a perfect square then x, y & z are completely di



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$N = P_1^x \cdot P_2^y \cdot P_3^z - - -$

If N is a perfect square then x, y & z are completely div by 2

gradeup

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gradeup

How many factors of $N = 2^5 . 3^8 . 5^6$ are perfect squares?

gradeup

How many factors of $N = 2^5 \cdot 3^8 \cdot 5^6$ are perfect squares?

2^0

2^1

2^2

2^3

2^4

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Toh Life Set Hai

gradeup

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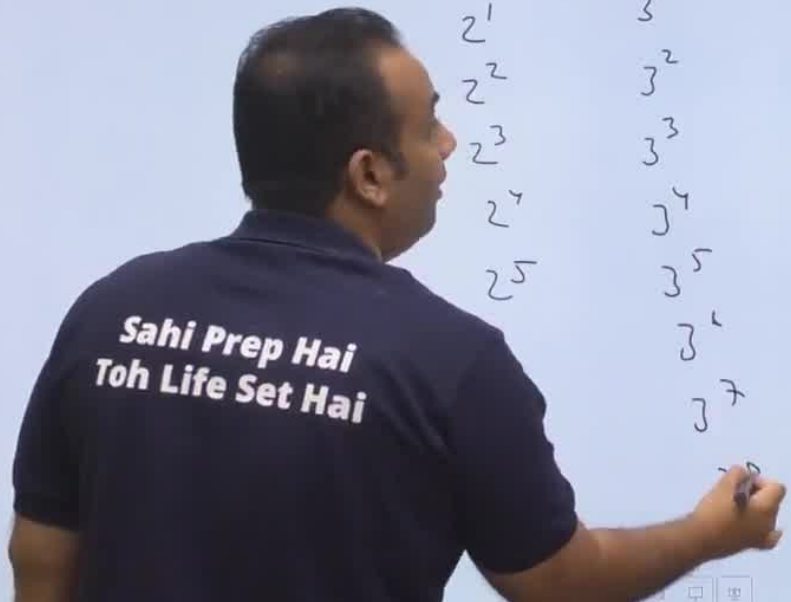

gradeup

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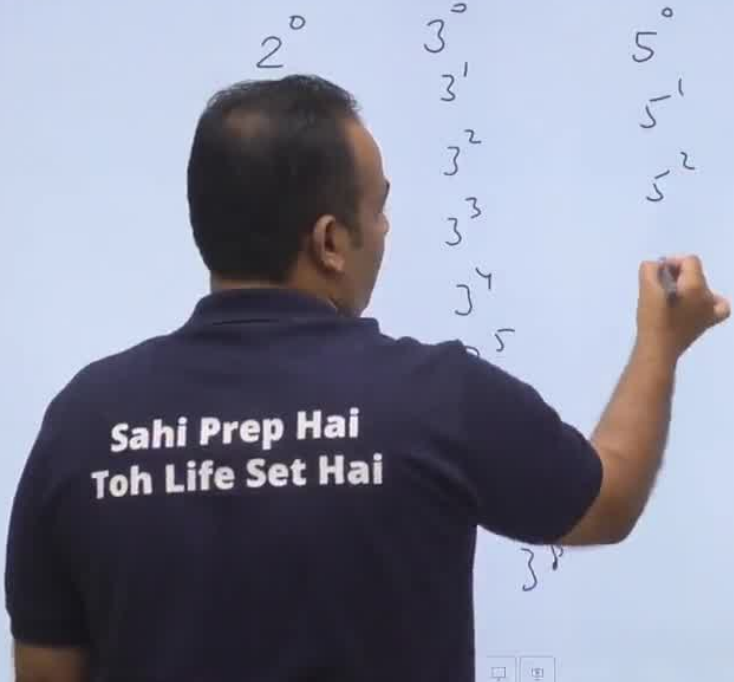

gradeup

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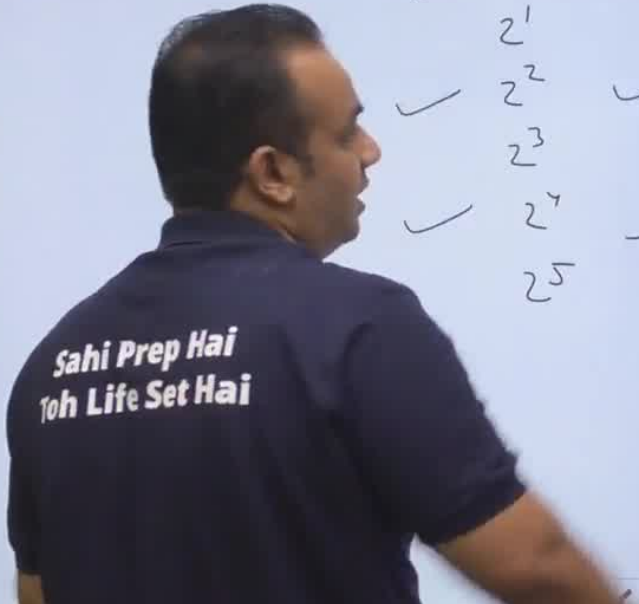

gradeup

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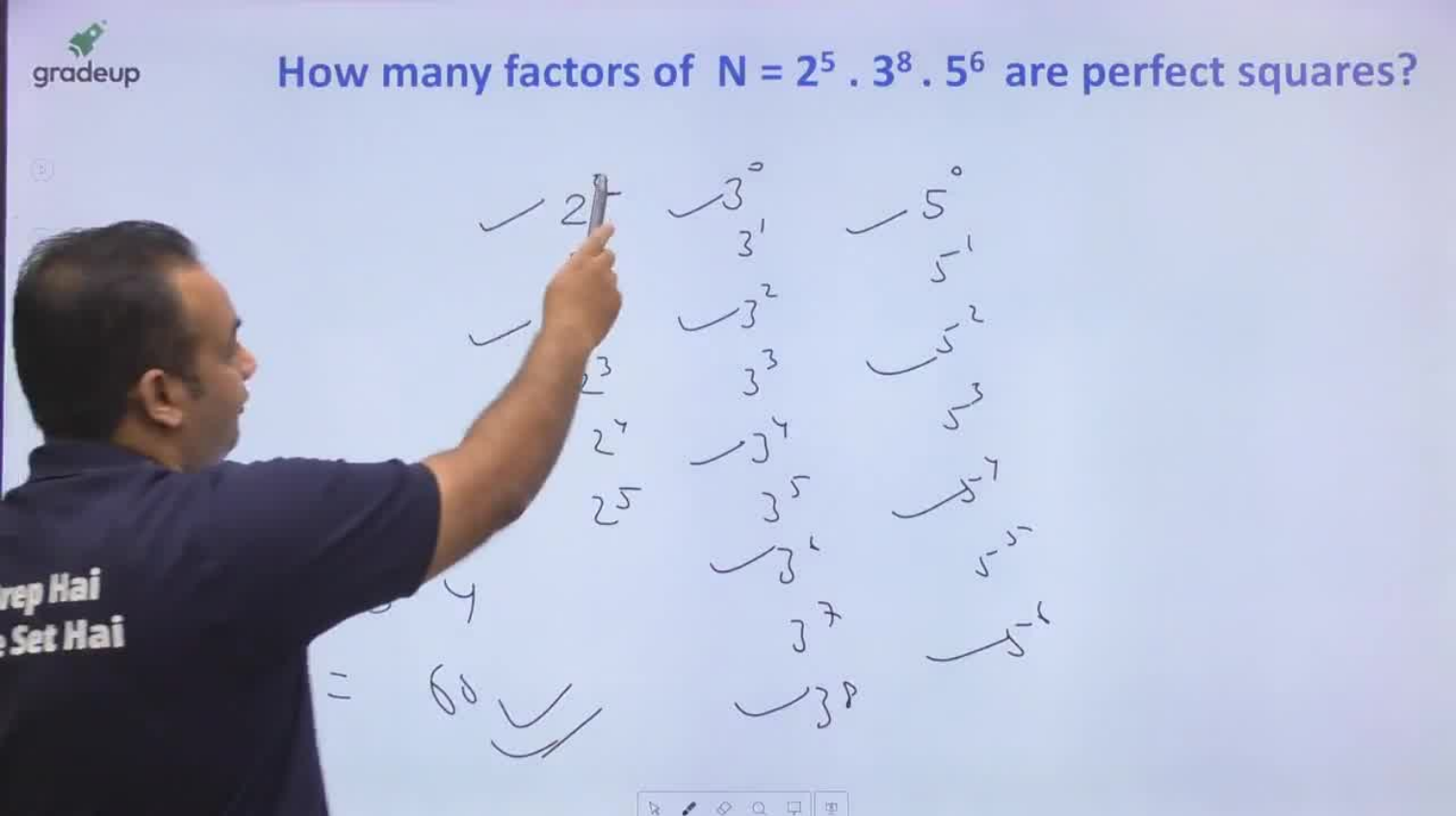

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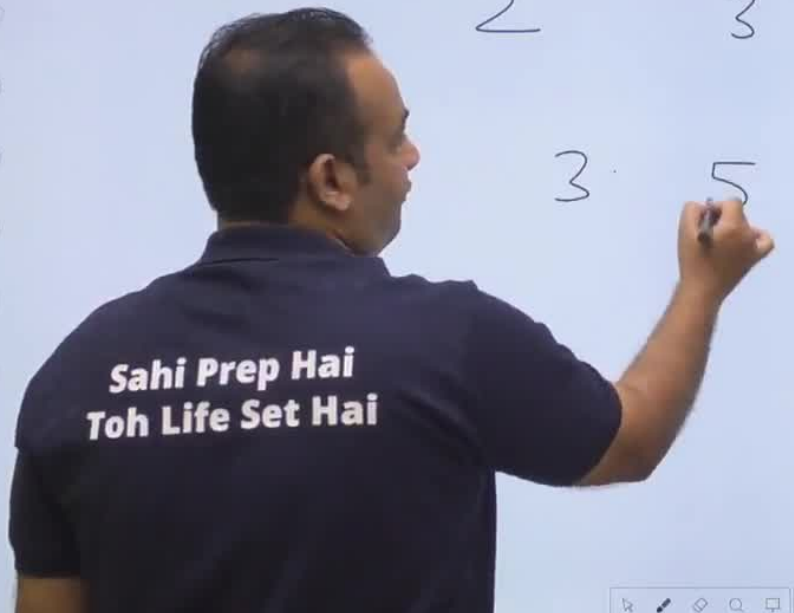
How many factors of $N = 2^5 \cdot 3^8 \cdot 5^6$ are perfect squares?

gradeup

How many factors of $N = 2^5 . 3^8 . 5^6$ are perfect squares?

$2^{0/2/4}$ $3^{0/2/4/6/8}$ $5^{0/2/4/6}$

3 · 5



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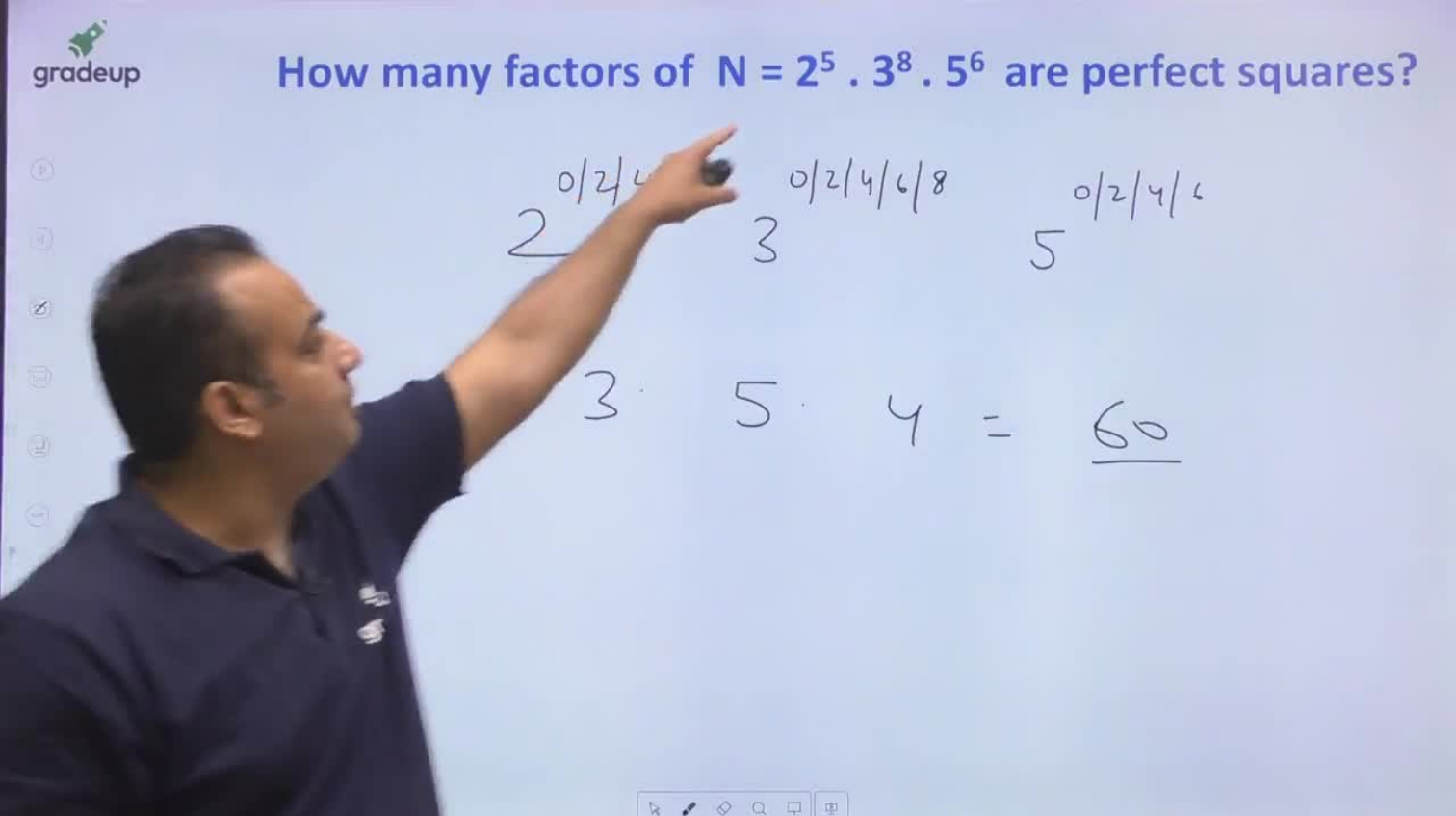


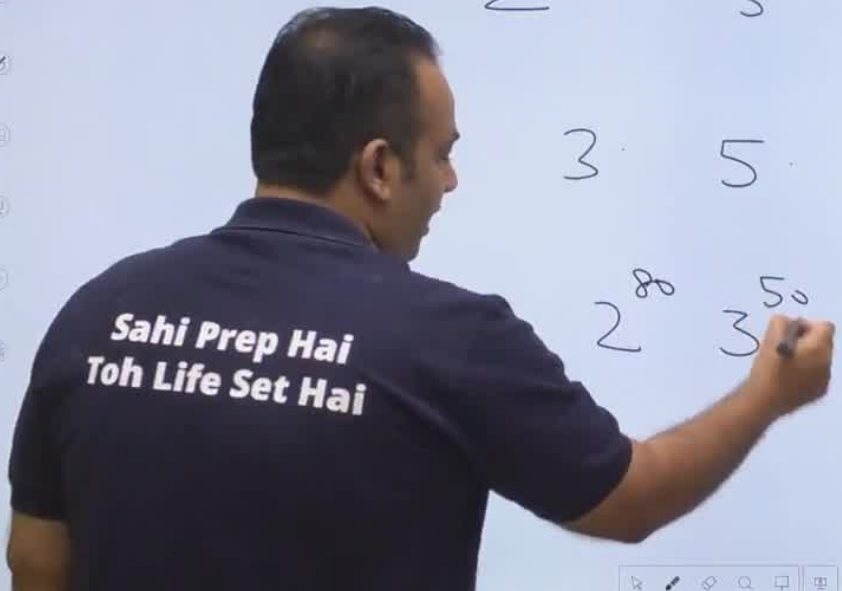
gradeup

How many factors of $N = 2^5 \cdot 3^8 \cdot 5^6$ are perfect squares?

$2^{0/2/4}$ $3^{0/2/4/6/8}$ $5^{0/2/4/6}$

$3 \cdot 5 \cdot 4 = \underline{60}$

2^{80} 3^{50}



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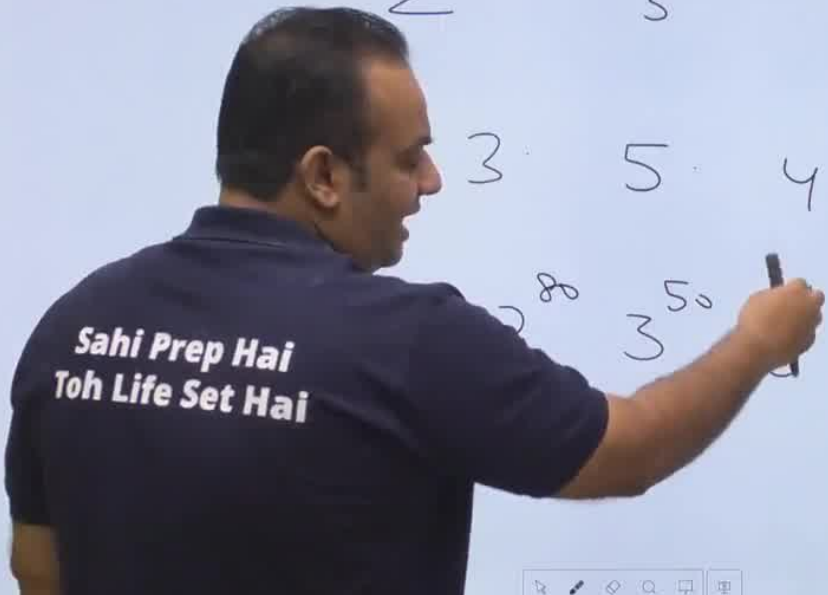


0/2/4 0/2/4/6/8 0/2/4/6

3 5 4 = 60

gradeup

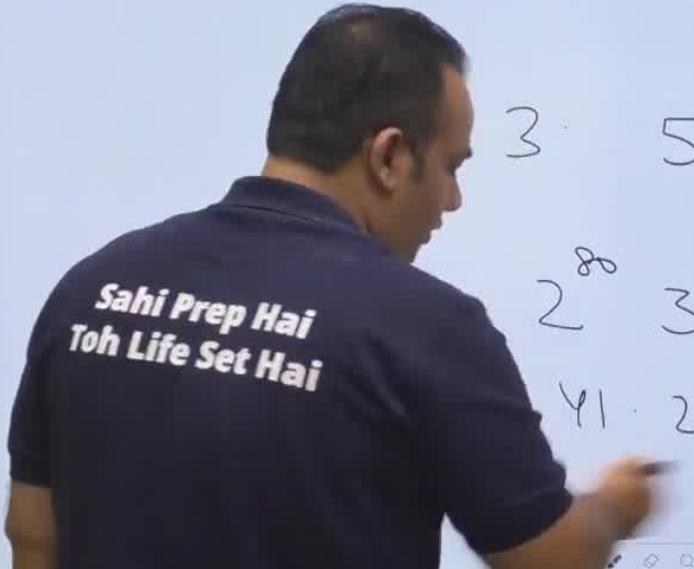
How many factors of $N = 2^5 \cdot 3^8 \cdot 5^6$ are perfect squares?

$2^{0/2/4}$ $3^{0/2/4/6/8}$ $5^{0/2/4/6}$

$3 \cdot 5 \cdot 4 = \underline{60}$

2^{80} 3^{50} 5^{11}

41 · 26 · 6



gradeup

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$2^{0/2/4}$ $3^{0/2/4/6/8}$ $5^{0/2/4/6}$

$3 \cdot 5 \cdot 4 = \underline{60}$

eg $2^{80}\ 3^{50}\ 5^{11}$

→ $41 \cdot 26 \cdot 6$

gradeup

Perfect Cube

gradeup

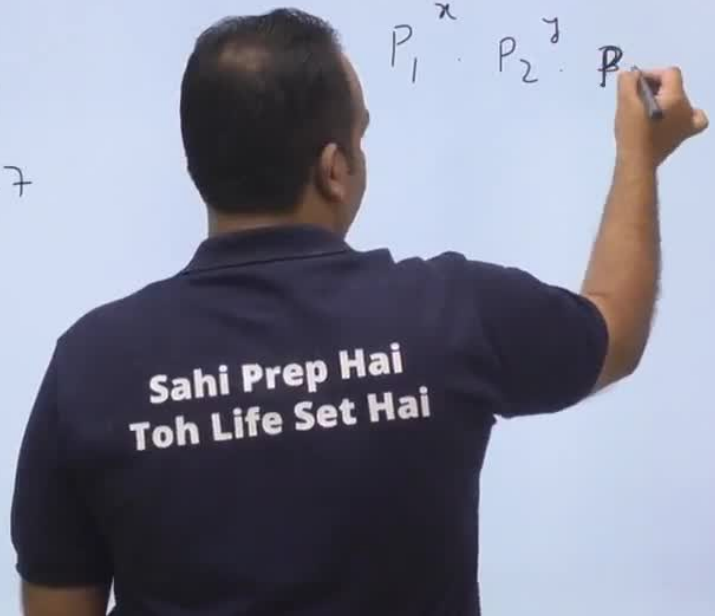
Perfect Cube

$1^3 = 1$

$2^3 = 8$

$3^3 = 27$

$P_1^x \cdot P_2^y \cdot P_3$



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Perfect Cube

$1^3 = 1$

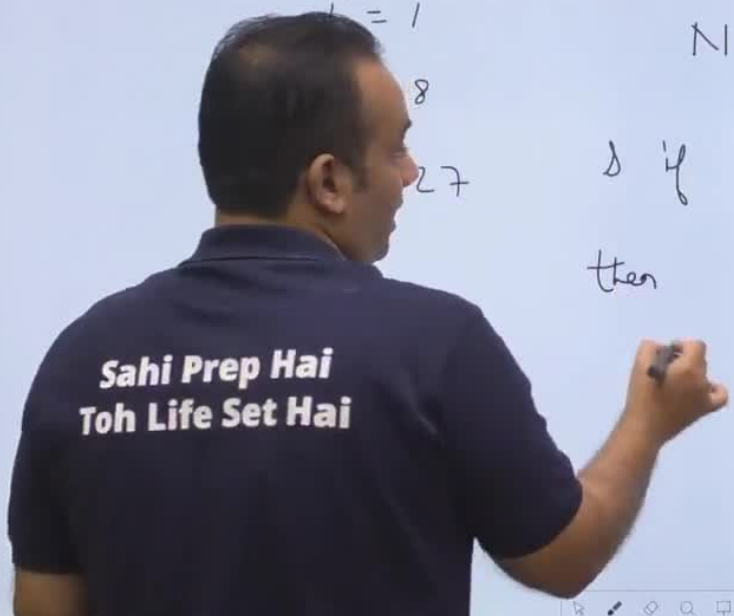
8

27

$N = P_1^{x} \cdot P_2^{y} \cdot P_3^{z} \ldots$

If N is a perfect cube

then



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Perfect Cube

Laser Pointer
Pen
ghlighter
ser
ide

$1^3 = 1$

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$3^3 = 27$

$N = P_1^x \cdot P_2^y \cdot P_3^z \ldots$

If N is a perfect cube

then x, y & z are multi

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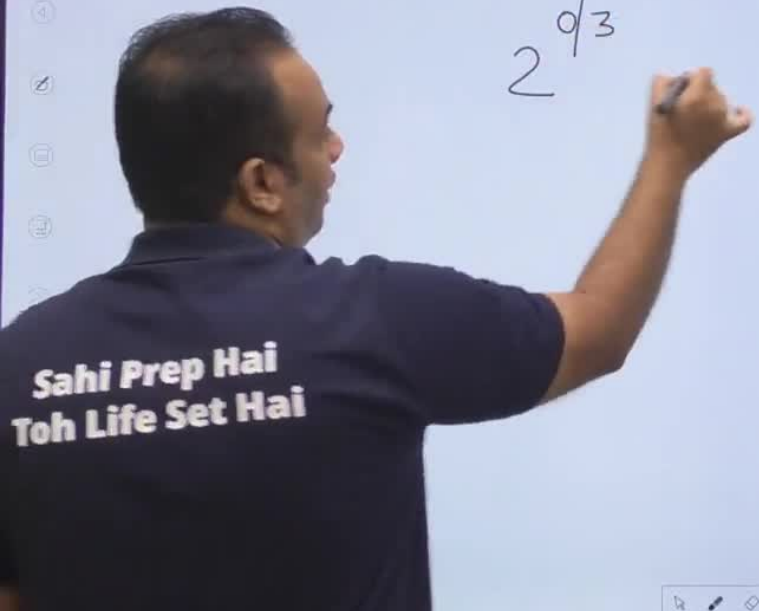
Life Set Hai

gradeup

How many factors of $N = 2^5 . 3^8 . 5^6$ are perfect cubes?

$2^{9/3}$



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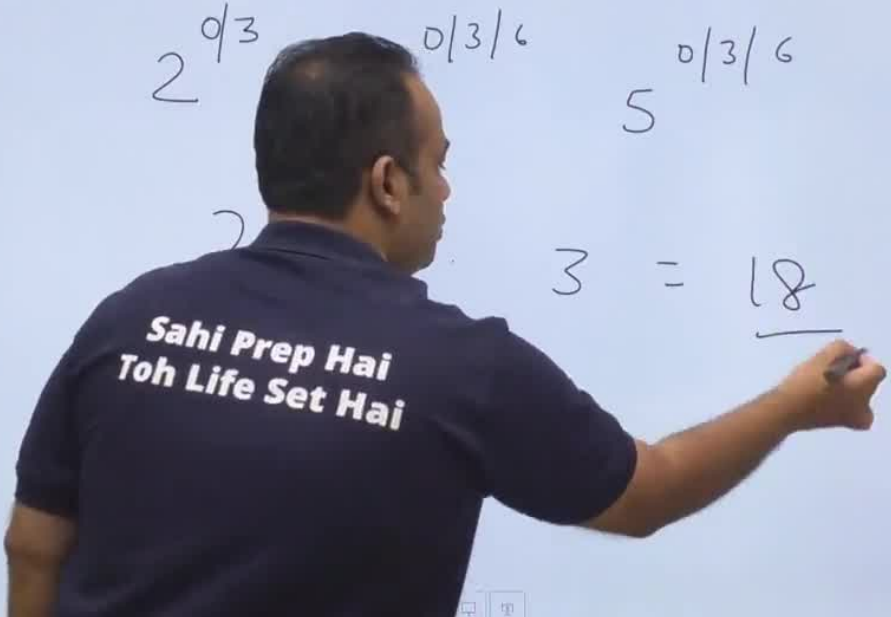

gradeup

How many factors of $N = 2^5 \cdot 3^8 \cdot 5^6$ are perfect cubes?

$2^{0/3}$ $3^{0/3/6}$ $5^{0/3/6}$

$2 \cdot 3 \cdot 3 = 18$

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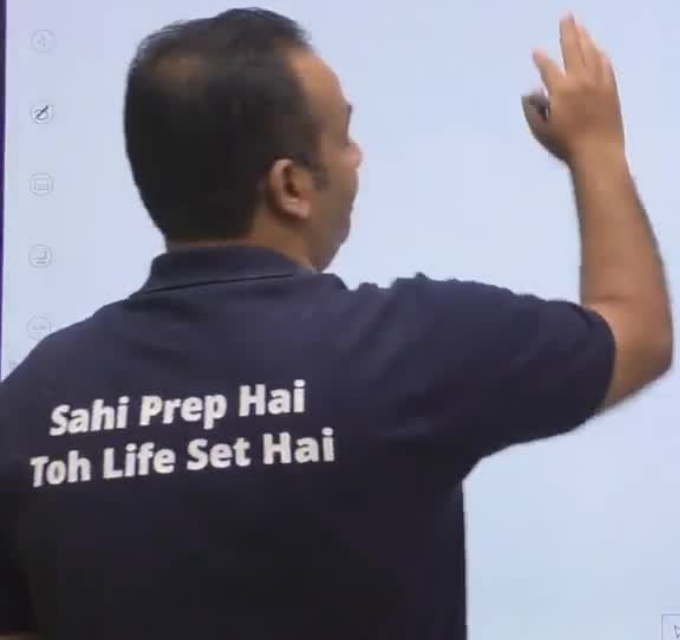
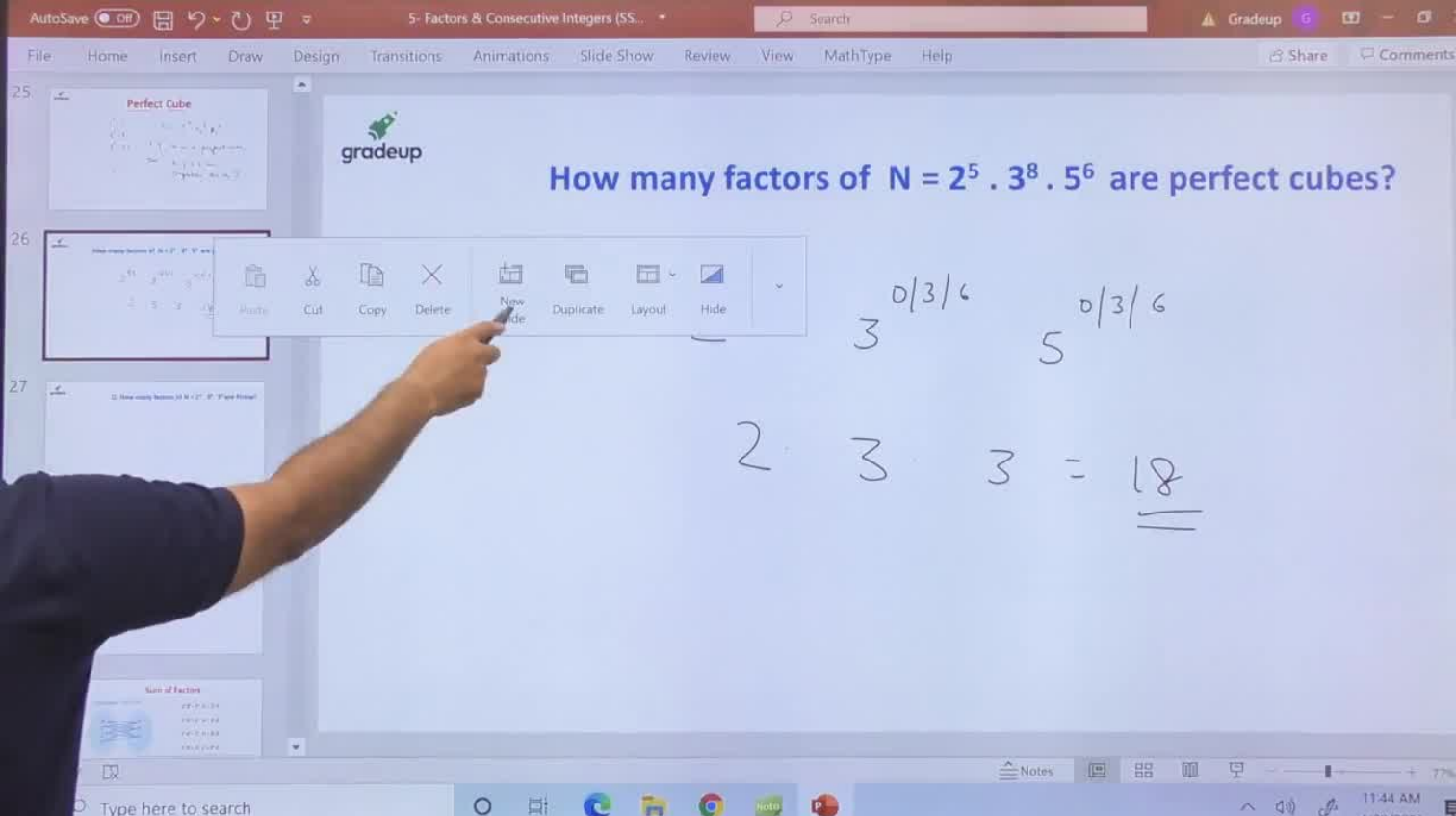
Q. How many factors of $N = 2^5 . 3^8 . 5^6$ are Prime?

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Share
Comments
25
Perfect Cube
26
27
Sum of Factors
gradeup
How many factors of N = 2^5 . 3^8 . 5^6 are perfect cubes?
Paste
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New Slide
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0 | 3 | 6
0 | 3 | 6
2 3 3 = 18
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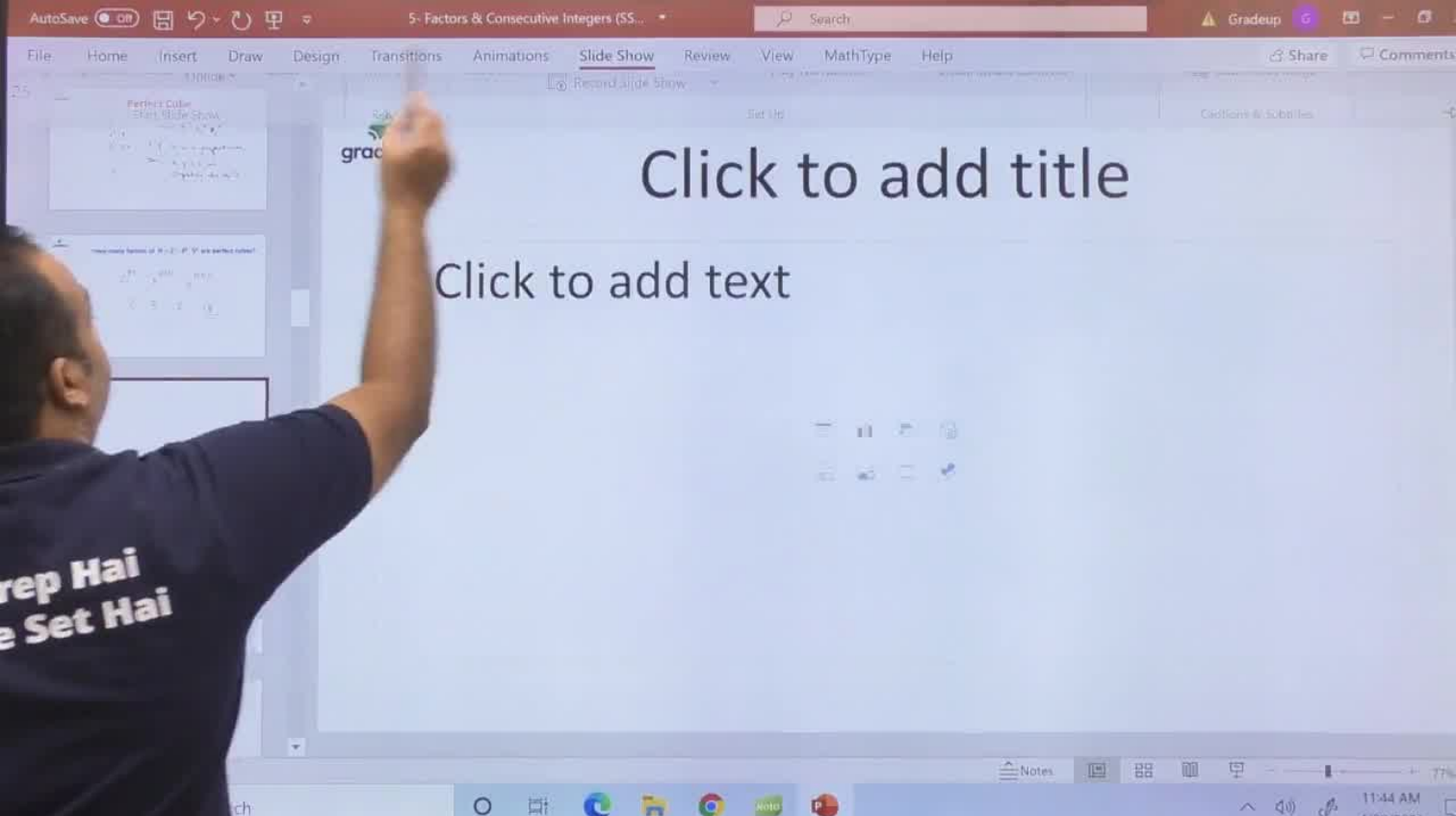
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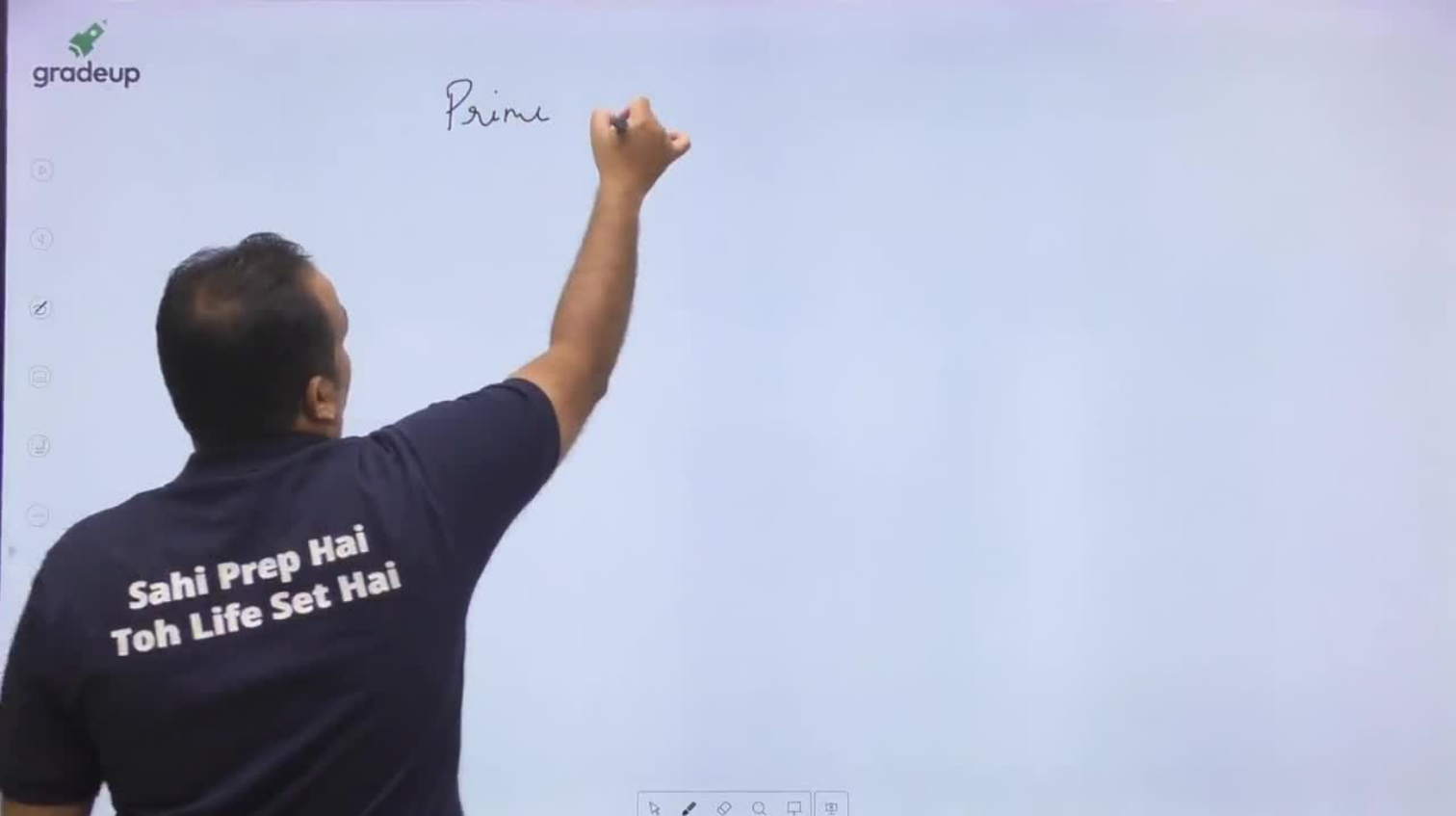
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Prime
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Toh Life Set Hai

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Prime Factors

$72 \rightarrow 2^3 \cdot 3^2$

tor of 72 →

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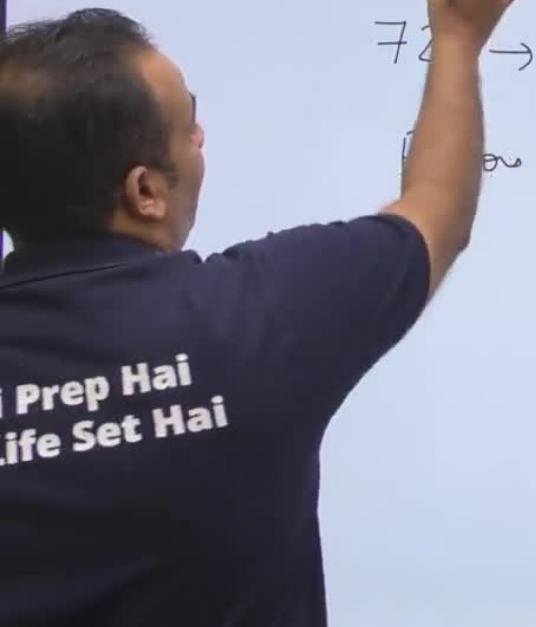
Prime Factors

$72 \rightarrow 2^3 \cdot 3^2$

Factors of 72 → 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72



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Prime Factors

$72 \rightarrow 2^3 \cdot 3^2$

ctors of 72 → 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72

ctors of 7

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Prime Factors

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Fa... are prim...

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Toh Life Set Hai

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Prime Factors

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ctors of 72 which are prime is 2

T

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Prime Factors

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Factors of 72 which are prime is 2

BUT SSC gives answer as 5

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Prime Factors

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...UT SSC gives answer as 5

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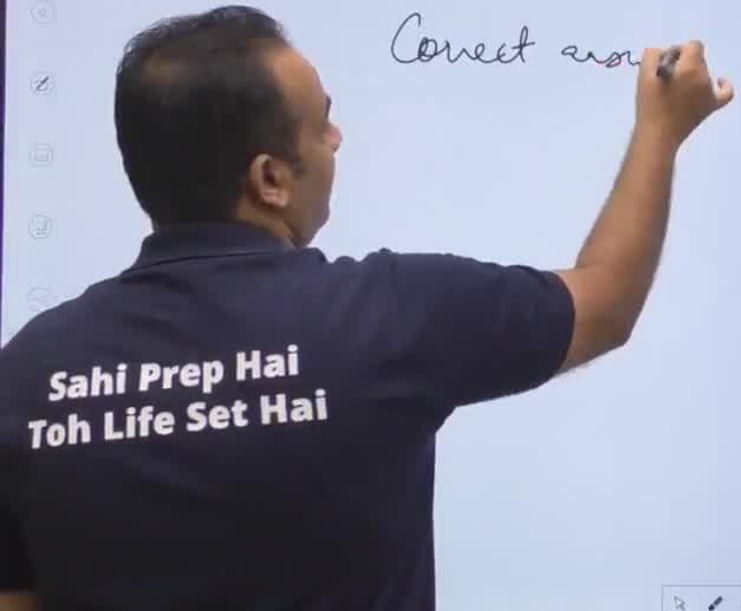
Q. How many factors of $N = 2^5 \cdot 3^8 \cdot 5^6$ are Prime?

Correct ans



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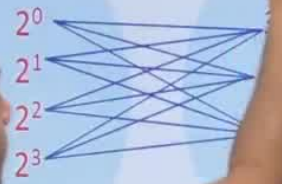
Sum of Factors

Let Number = $72 = 2^3 3^2$



$2^0.3^0 + 2^0 . 3^1 + 2^0.3^2$

$2^1.3^0 + 2^1 . 3^1 + 2^1.3^2$

$2^2.3^0 + 2^2 . 3^1 + 2^2.3^2$

$2^3.3^0 + 2^3 . 3^1 + 2^3.3^2$

$3^0(2^0 + 2^1 + 2^2 + 2^3) + 3^1(2^0 + 2^1 + 2^2 + 2^3) + 3^2(2^0 + 2^1 + 2^2 + 2^3)$

$= (2^0 + 2^1 + 2^2 + 2^3)(3^0 + 3^1 + 3^2) = 195$

Sahi Prep Hai
Toh Life Set Hai

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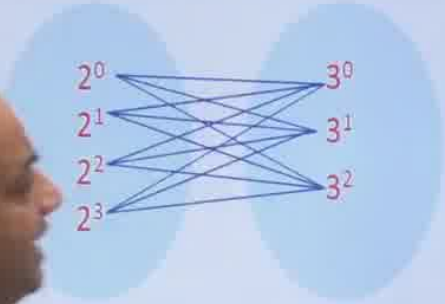
Sum of Factors

Let Number = $72 = 2^3 3^2$



$2^0.3^0 + 2^0.3^1 + 2^0.3^2$

$2^1.3^0 + 2^1.3^1 + 2^1.3^2$

$2^2.3^0 + 2^2.3^1 + 2^2.3^2$

$2^3.3^0 + 2^3.3^1 + 2^3.3^2$

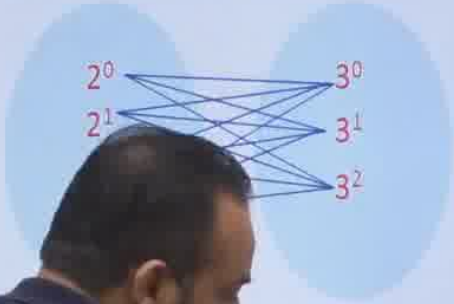
$3^0(2^0 + 2^1 + 2^2 + 2^3) + 3^1(2^0 + 2^1 + 2^2 + 2^3) + 3^2(2^0 + 2^1 + 2^2 + 2^3)$

$= (2^0 + 2^1 + 2^2 + 2^3)(3^0 + 3^1 + 3^2) = 195$

gradeup

Sum of Factors

Let Number = $72 = 2^3 3^2$



$2^0.3^0 + 2^0.3^1 + 2^0.3^2$

$2^1.3^0 + 2^1.3^1 + 2^1.3^2$

$2^2.3^0 + 2^2.3^1 + 2^2.3^2$

$2^3.3^0 + 2^3.3^1 + 2^3.3^2$

$3^0(2^0 + 2^1 + 2^2 + 2^3) + 3^1(2^0 + 2^1 + 2^2 + 2^3) + 3^2(2^0 + 2^1 + 2^2 + 2^3)$

$= (2^0 + 2^1 + 2^2 + 2^3)(3^0 + 3^1 + 3^2) = 195$

$\Rightarrow$ $1 + 2$

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Toh Life Set Hai

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Sum of Factors

Let Number = $72 = 2^3 3^2$

$2^0.3^0 + 2^0.3^1 + 2^0.3^2$

$2^1.3^0 + 2^1.3^1 + 2^1.3^2$

$2^2.3^0 + 2^2.3^1 + 2^2.3^2$

$2^3.3^0 + 2^3.3^1 + 2^3.3^2$

$3^0(2^0 + 2^1 + 2^2 + 2^3) + 3^1(2^0 + 2^1 + 2^2 + 2^3) + 3^2(2^0 + 2^1 + 2^2 + 2^3)$

$= (2^0 + 2^1 + 2^2 + 2^3)(3^0 + 3^1 + 3^2) = 195$

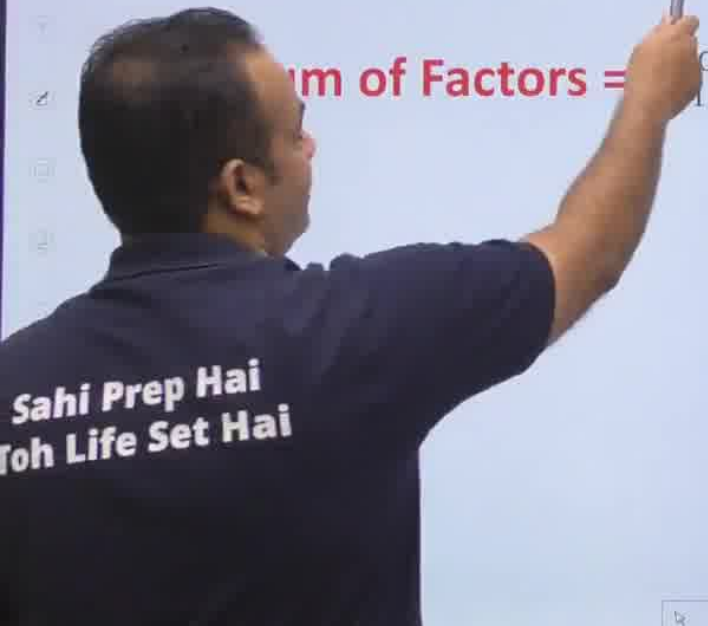
$(1+2+4+8)(1+3+9)$

$15 \cdot 13$

gradeup

If $N = P_1^a . P_2^b . P_3^c$

m of Factors = $(P_1^0+P_1^1+....P_1^a)(P_2^0+P_2^1+...P_2^b)(P_3^0+P_3^1+...P_3^c)$



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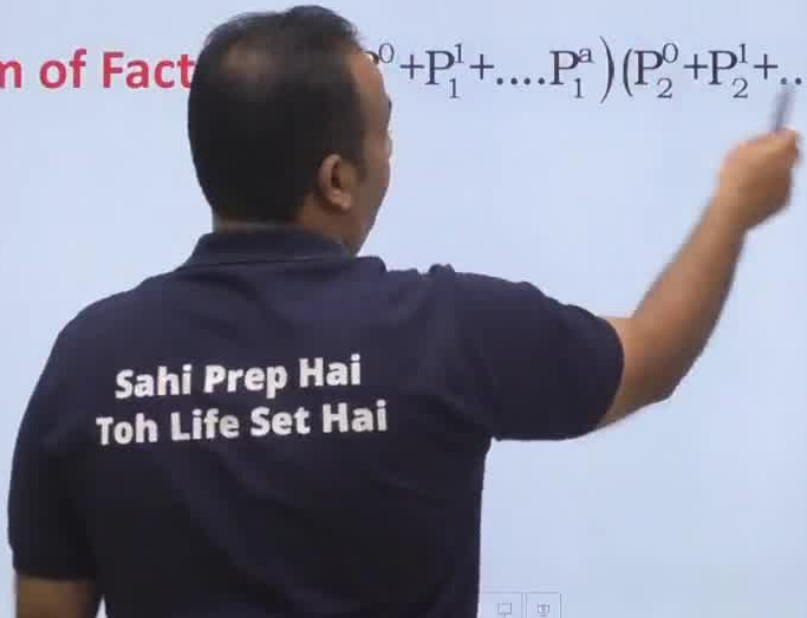
If $N = P_1^a . P_2^b . P_3^c$

Sum of Fact $\left(P_1^0+P_1^1+....P_1^a\right)\left(P_2^0+P_2^1+...P_2^b\right)\left(P_3^0+P_3^1+...P_3^c\right)$



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If $N = P_1^a . P_2^b . P_3^c$

um of Factors = $\left(P_1^0+P_1^1+....P_1^a\right)\left(P_2^0+P_2^1+...P_2^b\right)\left(P_3^0+P_3^1+...P_3^c\right)$

eg $N = 2^1 \cdot 3^1 \cdot 5^2$

sum of all the

of N

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Life Set Hai

gradeup

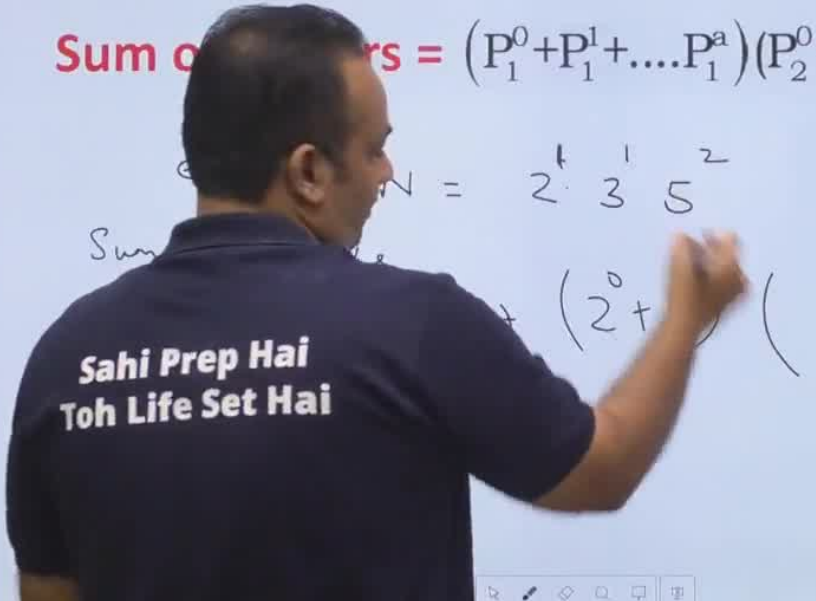
If $N = P_1^a . P_2^b . P_3^c$

Sum o... rs = $\left(P_1^0+P_1^1+....P_1^a\right)\left(P_2^0+P_2^1+...P_2^b\right)\left(P_3^0+P_3^1+...P_3^c\right)$

$N = 2^{\square} \cdot 3^{1} \cdot 5^{2}$

Sum ...

$\left(2^0+\right)\left($



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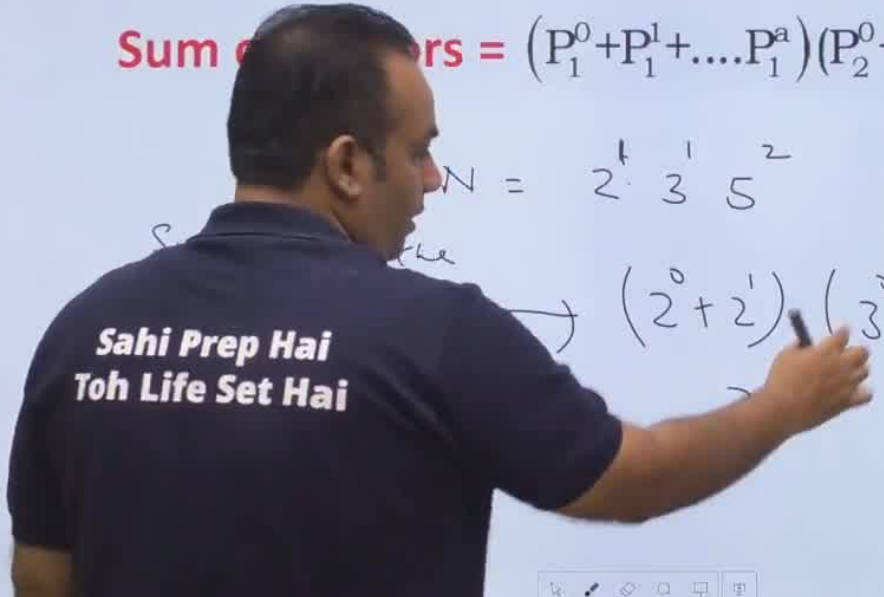
If $N = P_1^a . P_2^b . P_3^c$

Sum of factors = $\left(P_1^0+P_1^1+....P_1^a\right)\left(P_2^0+P_2^1+...P_2^b\right)\left(P_3^0+P_3^1+...P_3^c\right)$

$N = 2^4 \cdot 3^1 \cdot 5^2$

$\rightarrow (2^0+2^1)(3^0+3^1)(5^0+5^1+5^2)$



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If $N = P_1^a . P_2^b . P_3^c$

Sum of F... = $(P_1^0+P_1^1+....P_1^a)(P_2^0+P_2^1+...P_2^b)(P_3^0+P_3^1+...P_3^c)$

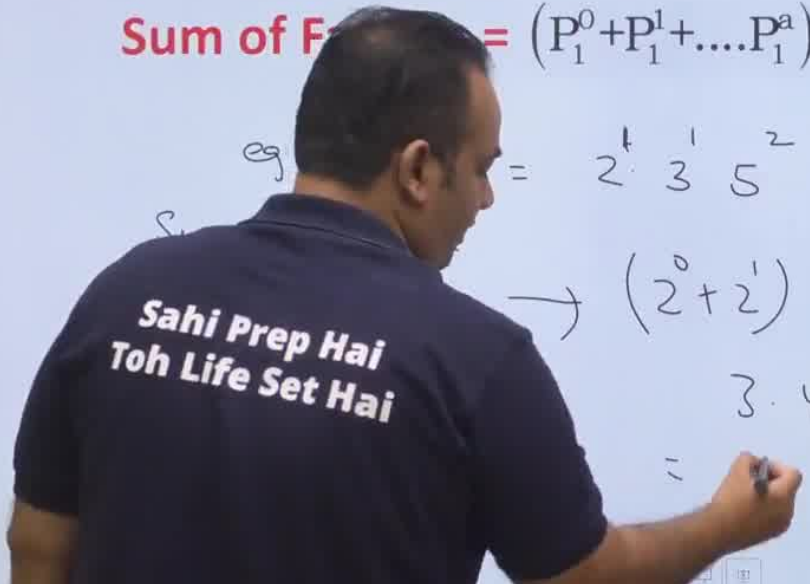
eg ... = $2^1 \cdot 3^1 \cdot 5^2$

S...

$\rightarrow (2^0+2^1)(3^0+3^1)(5^0+5^1+5^2)$

$3 \cdot 4 \cdot 31$

$=$



gradeup

If $N = P_1^a \cdot P_2^b \cdot P_3^c$

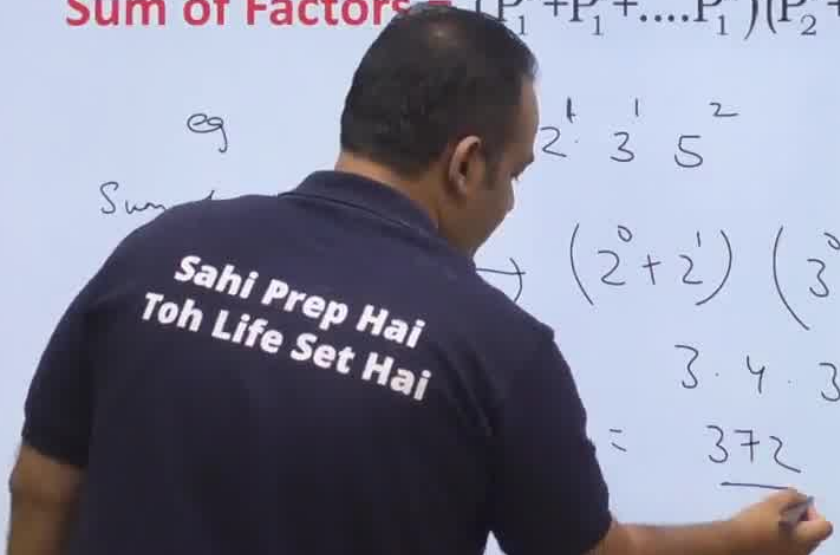
Sum of Factors $= (P_1^0 + P_1^1 + \ldots P_1^a)(P_2^0 + P_2^1 + \ldots P_2^b)(P_3^0 + P_3^1 + \ldots P_3^c)$

eg $2^1 \cdot 3^1 \cdot 5^2$

Sum $\rightarrow (2^0 + 2^1)(3^0 + 3^1)(5^0 + 5^1 + 5^2)$

$3 \cdot 4 \cdot 31$

$= 372$



gradeup

If $N = P_1^a . P_2^b . P_3^c$

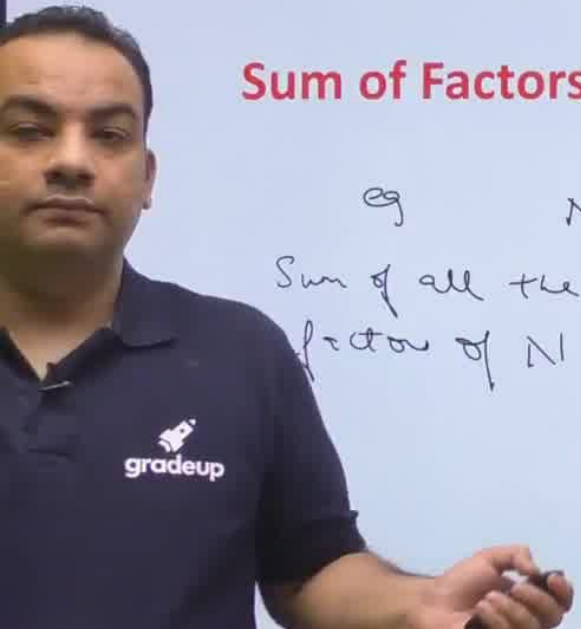
Sum of Factors = $(P_1^0+P_1^1+....P_1^a)(P_2^0+P_2^1+...P_2^b)(P_3^0+P_3^1+...P_3^c)$

eg $N = 2^1 3^1 5^2$

Sum of all the factors of N $\rightarrow (2^0+2^1)(3^0+3^1)(5^0+5^1+5^2)$

$3 \cdot 4 \cdot 31$

$= 372$

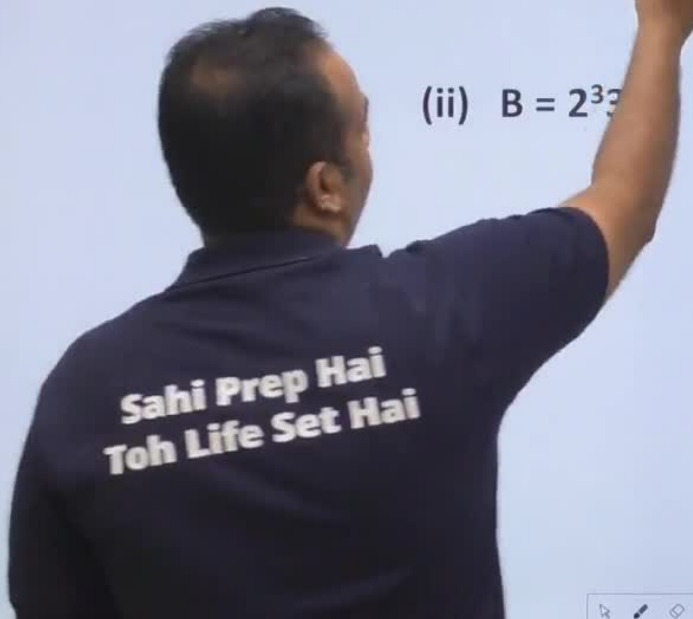


gradeup

Q. Find the sum of all the factors of:

(i) A = 720

(ii) B = 2^{3}

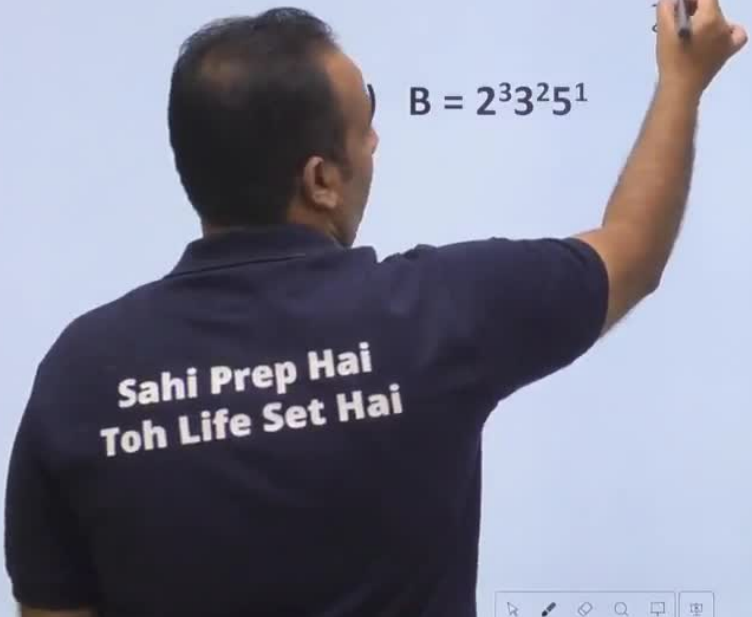


gradeup

Q. Find the sum of all the factors of:

(i) $A = 720 \rightarrow 2^4 \cdot 3^2 5^1$

(ii) $B = 2^3 3^2 5^1$



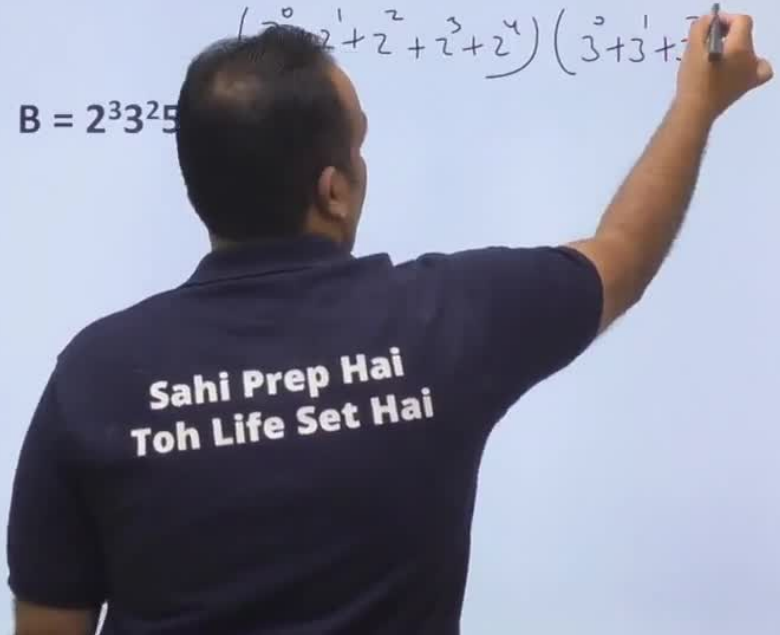
gradeup

Q. Find the sum of all the factors of:

(i) $A = 720 \rightarrow 2^4 \cdot 3^2 \cdot 5^1$

$(2^0 + 2^1 + 2^2 + 2^3 + 2^4)(3^0 + 3^1 + \ldots$

(ii) $B = 2^3 3^2 5$



gradeup

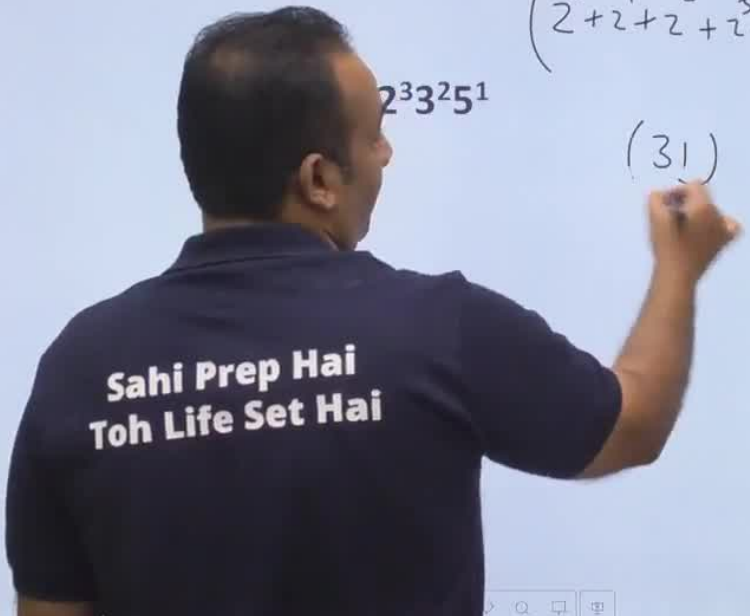
Q. Find the sum of all the factors of:

(i) $A = 720 \rightarrow 2^4 \cdot 3^2 \cdot 5^1$

$(2^0+2^1+2^2+2^3+2^4)(3^0+3^1+3^2)(5^0+5^1)$

$2^3 3^2 5^1$

(31)



gradeup

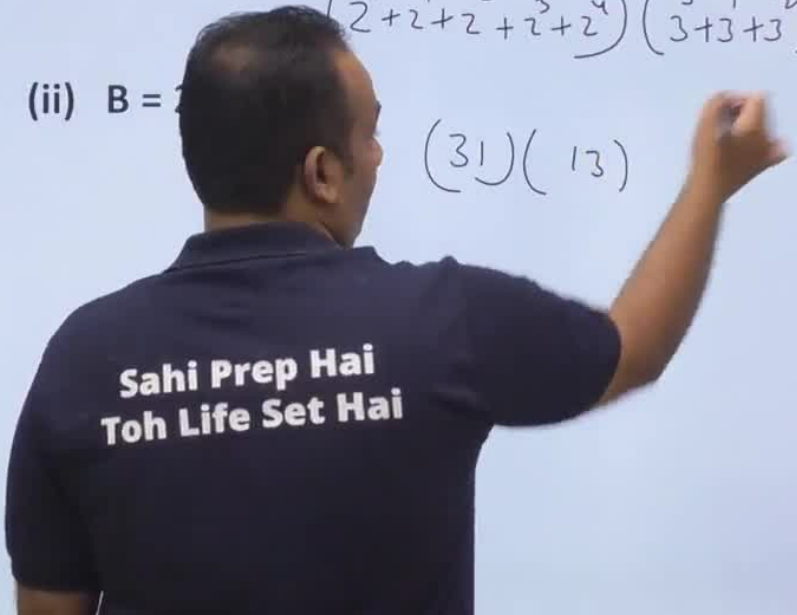
Q. Find the sum of all the factors of:

(i) $A = 720 \rightarrow 2^4 \cdot 3^2 \cdot 5^1$

$(2^0+2^1+2^2+2^3+2^4)(3^0+3^1+3^2)(5^0+5^1)$

(ii) $B =$

$(31)(13)$



gradeup

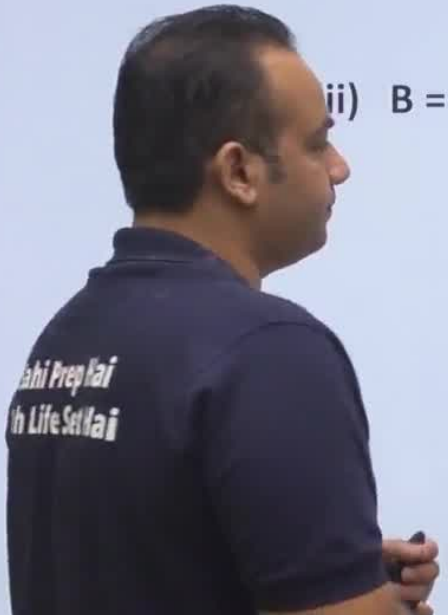
Q. Find the sum of all the factors of:

(i) $A = 720 \rightarrow 2^4 3^2 5^1$

$(2^0+2^1+2^2+2^3+2^4)(3^0+3^1+3^2)(5^0+5^1)$

ii) $B = 2^3 3^2 5^1$

$(31)(13)(6)$



gradeup

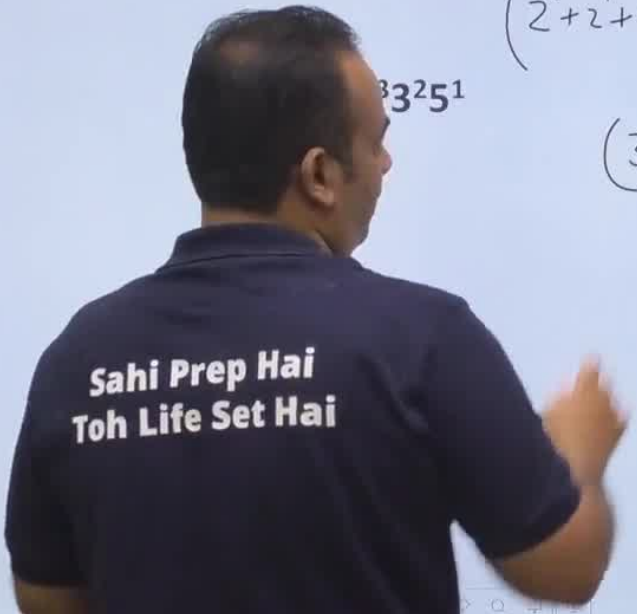
Q. Find the sum of all the factors of:

(i) $A = 720 \rightarrow 2^4 3^2 5^1$

$(2^0+2^1+2^2+2^3+2^4)(3^0+3^1+3^2)(5^0+5^1)$

$3^2 5^1$

$(31)(13)(6)$



gradeup

Q. Find the sum of all the factors of:

(i) $A = 720 \rightarrow 2^4 3^2 5^1$

$(2^0+2^1+2^2+2^3+2^4)(3^0+3^1+3^2)(5^0+5^1)$

$(31)(13)(6)$

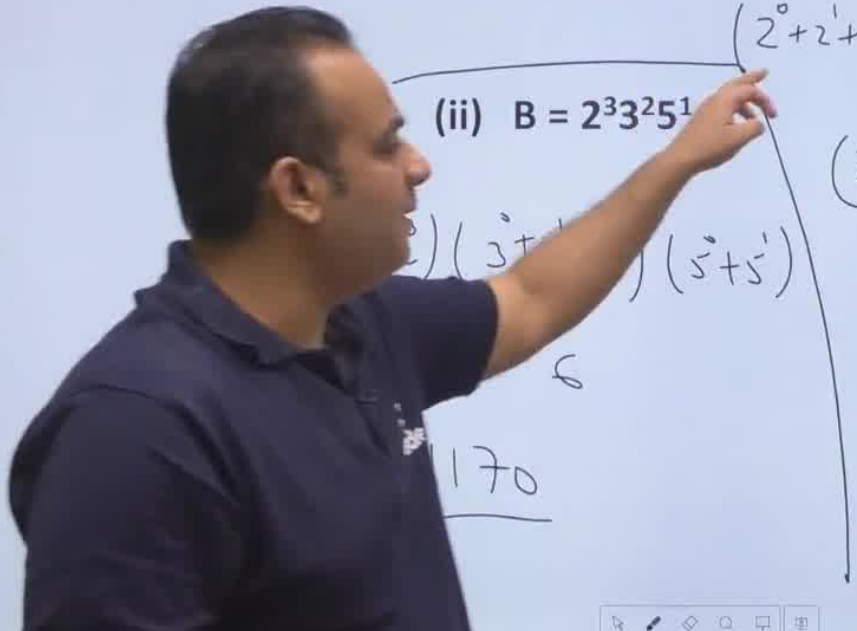
$= 2418$

(ii) $B = 2^3 3^2 5^1$

(5^0+5^1)

6

170



gradeup

Q. Find the sum of all the factors of:

(i) A = 720 → $2^4 3^2 5^1$

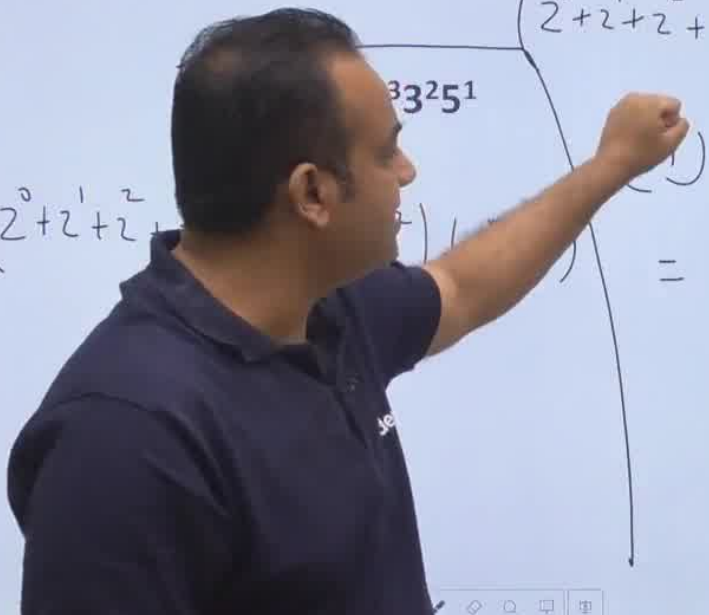
$(2^0+2^1+2^2+2^3+2^4)(3^0+3^1+3^2)(5^0+5^1)$

$3^2 5^1$

$(2^0+2^1+2^2$

$)(13)(6)$

$= 2418$



gradeup

Q. Find the sum of all the factors of:

(i) $A = 720 \rightarrow 2^4 3^2 5^1$

$(2^0+2^1+2^2+2^3+2^4)(3^0+3^1+3^2)(5^0+5^1)$

$(31)(13)(6)$

$= 2418$

$B = 2^3 \ldots 5^1$

$(2^0+\ldots)(5^0+5^1)$

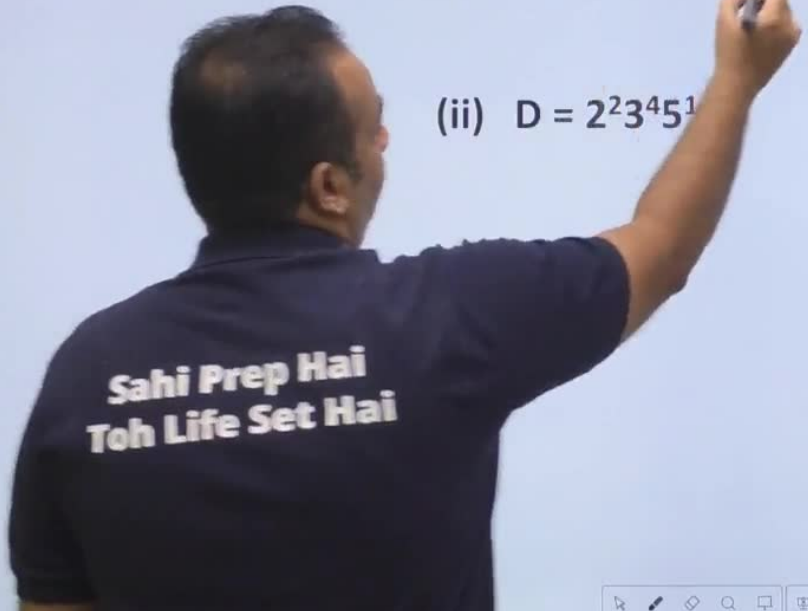
6

gradeup

Q. Find the sum of all even factors of:

(i) $C = 2^3 3^2 5^1$

(ii) $D = 2^2 3^4 5^1$

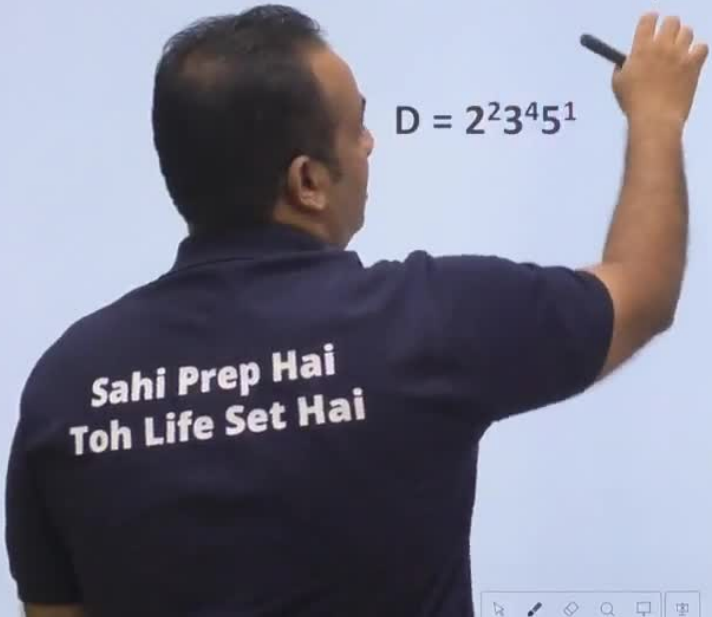


gradeup

Q. Find the sum of all even factors of:

(i) $C = 2^3 3^2 5^1$ $\left(2^1+2^2+2^3\right)\left(3^0+3^1+3^2\right)\left(5^0+5^1\right)$

$D = 2^2 3^4 5^1$

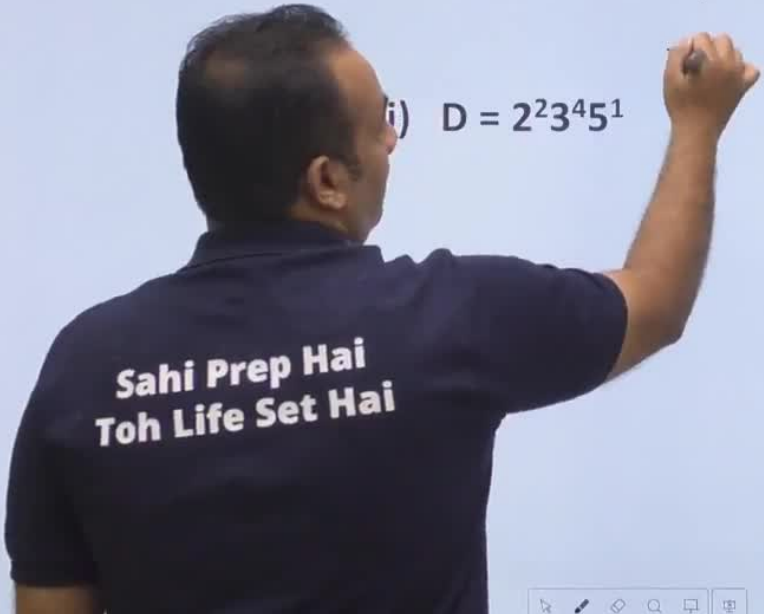


gradeup

Q. Find the sum of all even factors of:

(i) $C = 2^3 3^2 5^1$ $\left(2^1+2^2+2^3\right)\left(3^0+3^1+3^2\right)\left(5^0+5^1\right)$

(ii) $D = 2^2 3^4 5^1$



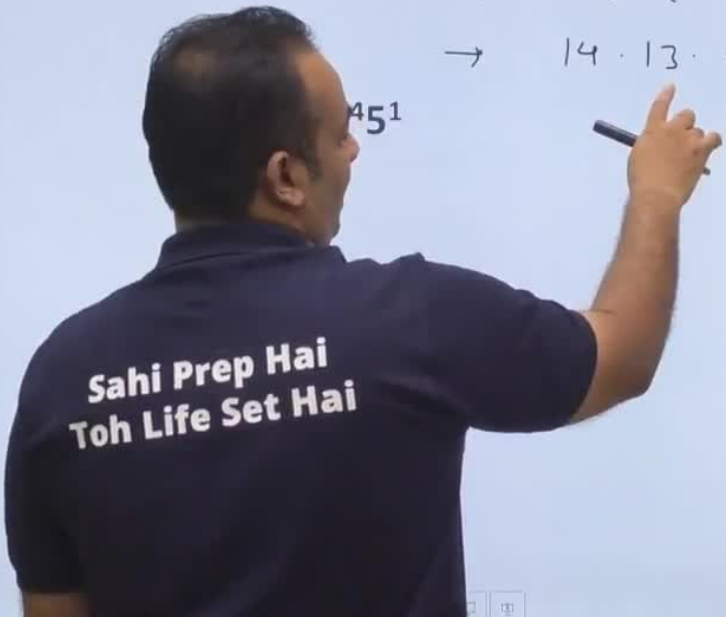
gradeup

Q. Find the sum of all even factors of:

(i) $C = 2^3 3^2 5^1$ $\left(2^1+2^2+2^3\right)\left(3^0+3^1+3^2\right)\left(5^0+5^1\right)$

$\rightarrow \quad 14 \cdot 13 \cdot 6$

$^{4}5^{1}$



gradeup

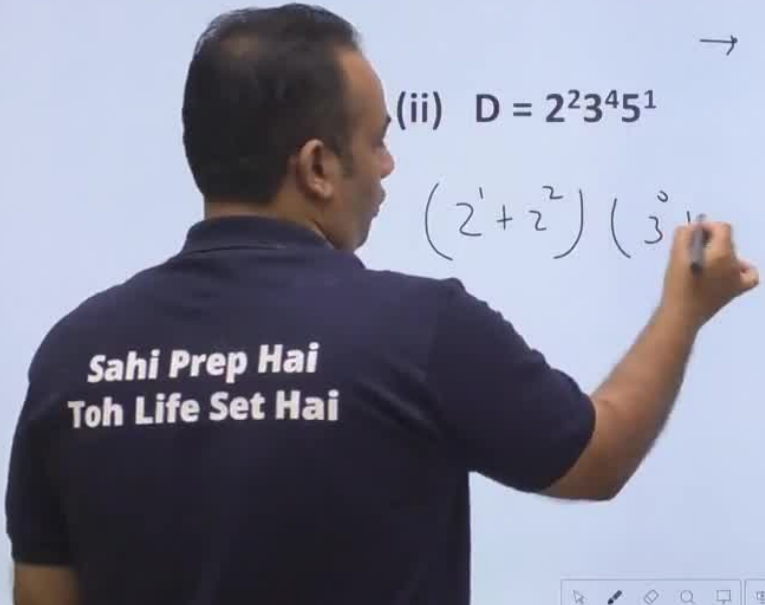
Q. Find the sum of all even factors of:

(i) $C = 2^3 3^2 5^1$ $\quad (2^1+2^2+2^3)(3^0+3^1+3^2)(5^0+5^1)$

$\rightarrow \quad 14 \cdot 13 \cdot 6 = \underline{1092}$

(ii) $D = 2^2 3^4 5^1$

$(2^1+2^2)(3^0$



gradeup

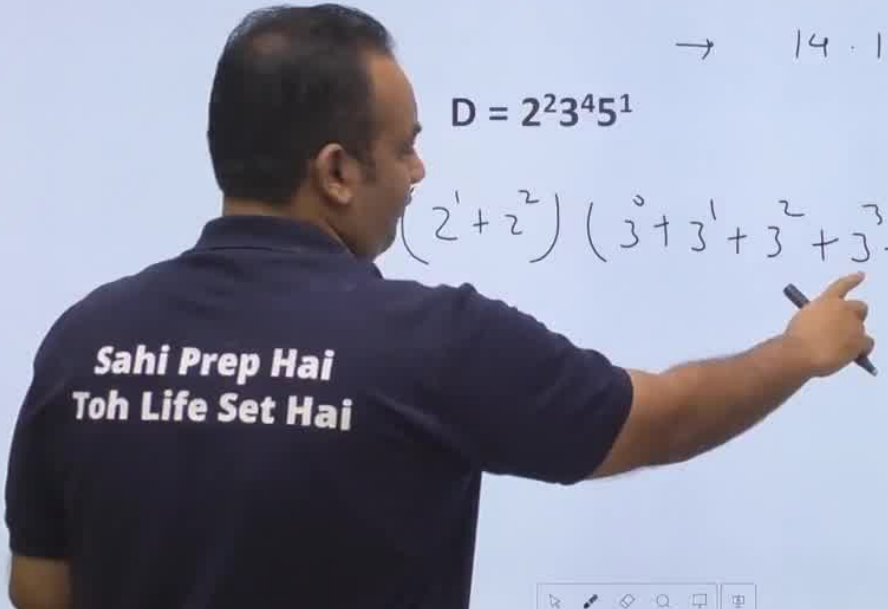
Q. Find the sum of all even factors of:

(i) $C = 2^3 3^2 5^1$ $\quad (2^1+2^2+2^3)(3^0+3^1+3^2)(5^0+5^1)$

$\rightarrow \quad 14 \cdot 13 \cdot 6 = \underline{1092}$

$D = 2^2 3^4 5^1$

$(2^1+2^2)(3^0+3^1+3^2+3^3+3^4)(5^0+5^1)$



gradeup

Q. Find the sum of all even factors of:

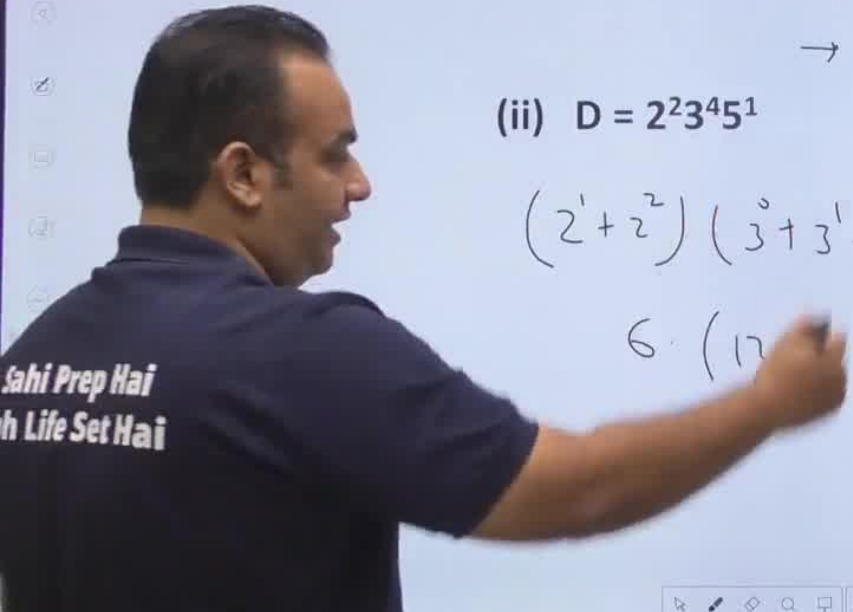
(i) $C = 2^3 3^2 5^1$ $\quad (2^1+2^2+2^3)(3^0+3^1+3^2)(5^0+5^1)$

$\rightarrow \quad 14 \cdot 13 \cdot 6 = \underline{1092}$

(ii) $D = 2^2 3^4 5^1$

$(2^1+2^2)(3^0+3^1+3^2+3^3+3^4)(5^0+5^1)$

$6 \cdot (17$



gradeup

Q. Find the sum of all even factors of:

(i) $C = 2^3 3^2 5^1$ $\quad (2^1+2^2+2^3)(3^0+3^1+3^2)(5^0+5^1)$

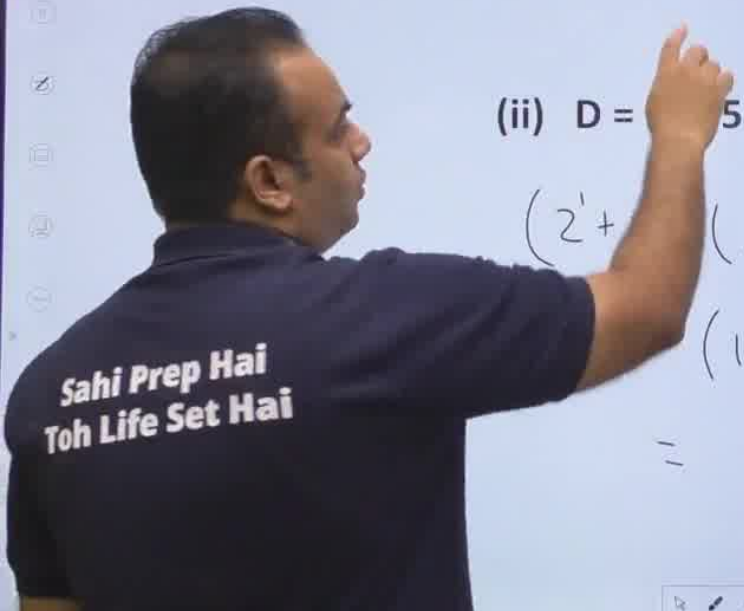
$\rightarrow \quad 14 \cdot 13 \cdot 6 = 1092$

(ii) $D = \quad 5^1$

$(2^1+ \quad (3^0+3^1+3^2+3^3+3^4)\ (5^0+5^1)$

$(121)(6)$

$= 4356$



gradeup

Q. Find the sum of all even factors of:

(i) $C = 2^3 3^2 5^1$ $(2^1+2^2+2^3)(3^0+3^1+3^2)(5^0+5^1)$

$\rightarrow$ $13 \cdot 6 = 1092$

$D = 2^2 3^4 5^1$

$3^2+3^3+3^4)\ (5^0+5^1)$

$(\quad)\ (\quad)$

4356

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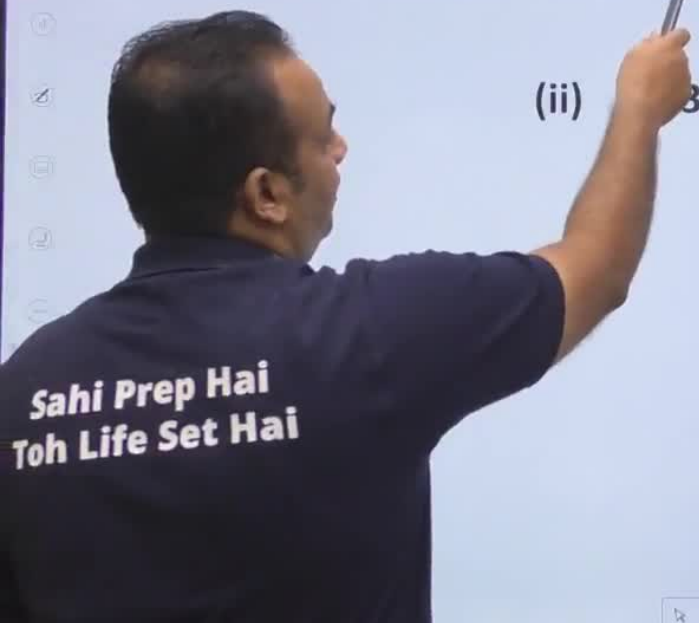
gradeup

Q. Find the sum of all odd factors of:

(i) $A = 2^4 3^3 5^1$

(ii) $3^2 5^3$



gradeup

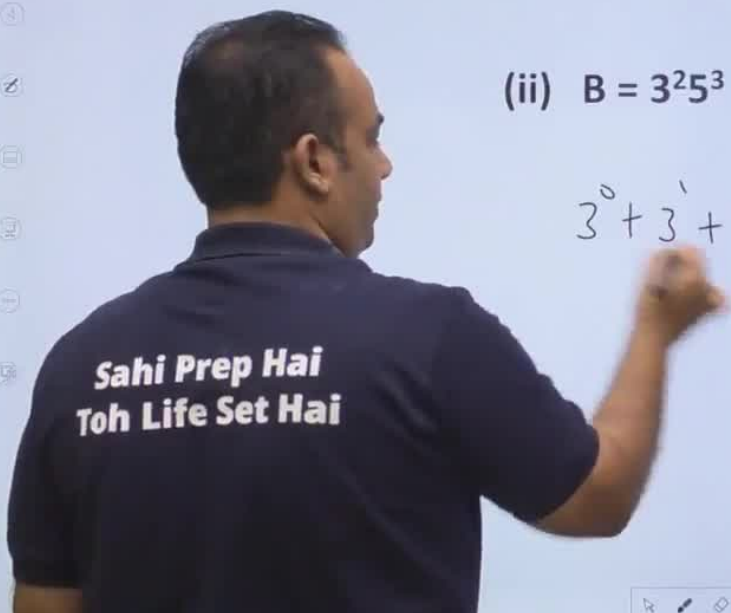
Q. Find the sum of all odd factors of:

(i) $A = 2^4 3^3 5^1$ → $(3^0+3^1+3^2+3^3)(5^0+5^1)$

$40 \cdot 6 = 240$

(ii) $B = 3^2 5^3$

$3^0+3^1+3^2)$



gradeup

Q. Find the sum of all odd factors of:

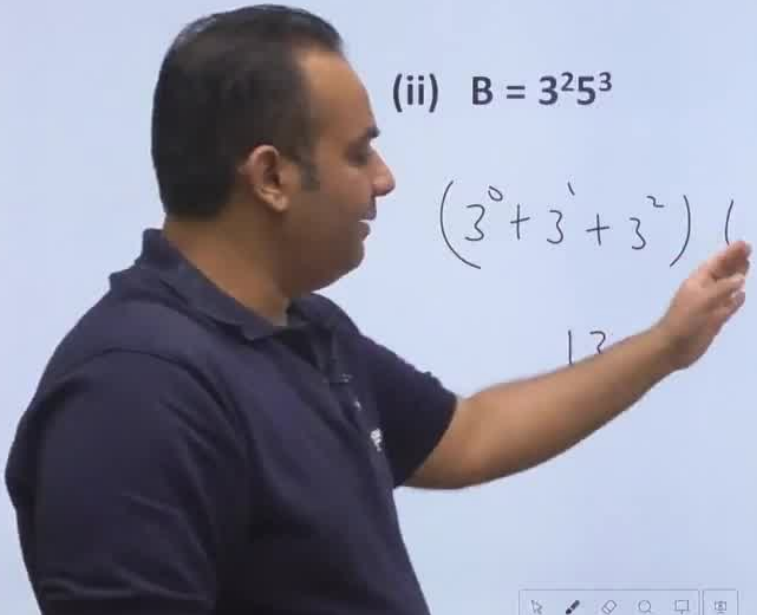
(i) $A = 2^4 3^3 5^1 \rightarrow (3^0+3^1+3^2+3^3)(5^0+5^1)$

$40 \cdot 6 = 240$

(ii) $B = 3^2 5^3$

$(3^0+3^1+3^2)(5^0+5^1+5^2+5^3)$

13



gradeup

Q. Find the sum of all odd factors of:

(i) $A = 2^4 3^3 5^1$ → $(3^0+3^1+3^2+3^3)(5^0+5^1)$

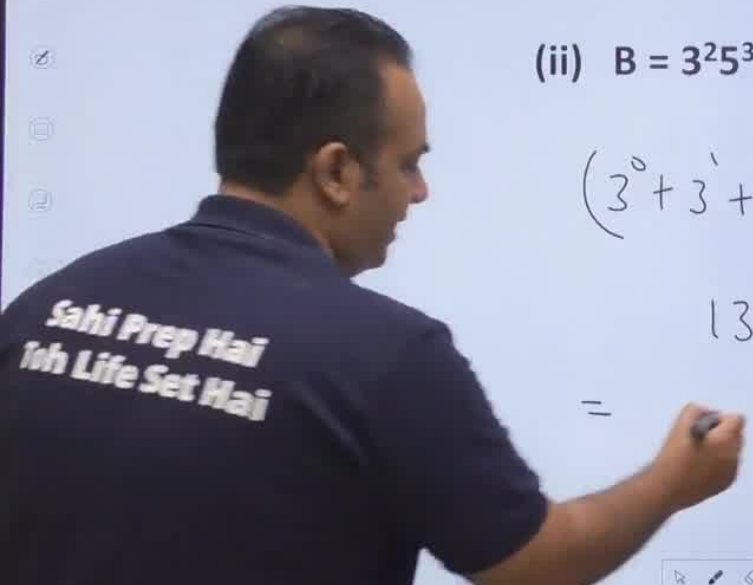
$40 \cdot 6 = 240$

(ii) $B = 3^2 5^3$

$(3^0+3^1+3^2)(5^0+5^1+5^2+5^3)$

13×156

$=$



gradeup

Q. Find the sum of all odd factors of:

(i) $A = 2^4 3^3 5^1 \rightarrow (3^0+3^1+3^2+3^3)(5^0+5^1)$

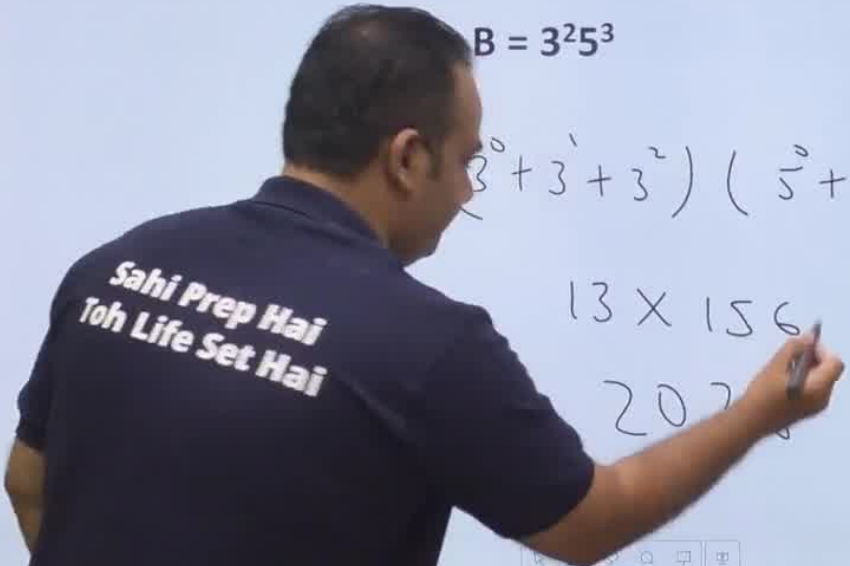
$40 \cdot 6 = 240$

$B = 3^2 5^3$

$(3^0+3^1+3^2)(5^0+5^1+5^2+5^3)$

13×156

2028

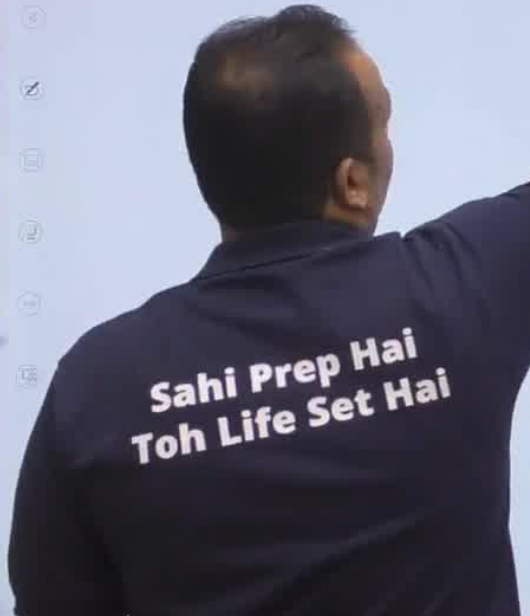


gradeup

Product of all the factors

$72 = 2^3 \times 3^2$

1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72



Product of all the factors of 72

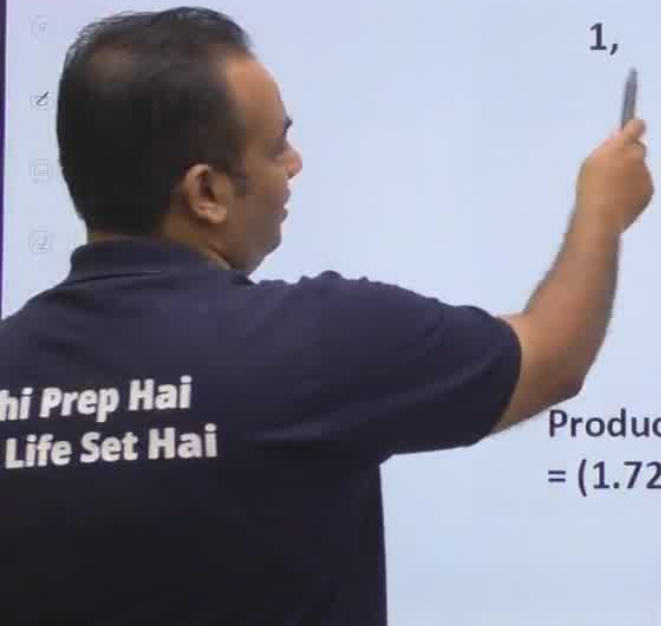
$= (1.72)(2.36)(3.24)(4.18)(6.12)(8.9) = (72)^6$

gradeup

Product of all the factors

$72 = 2^3 3^2$

1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72



Product of all the factors of 72

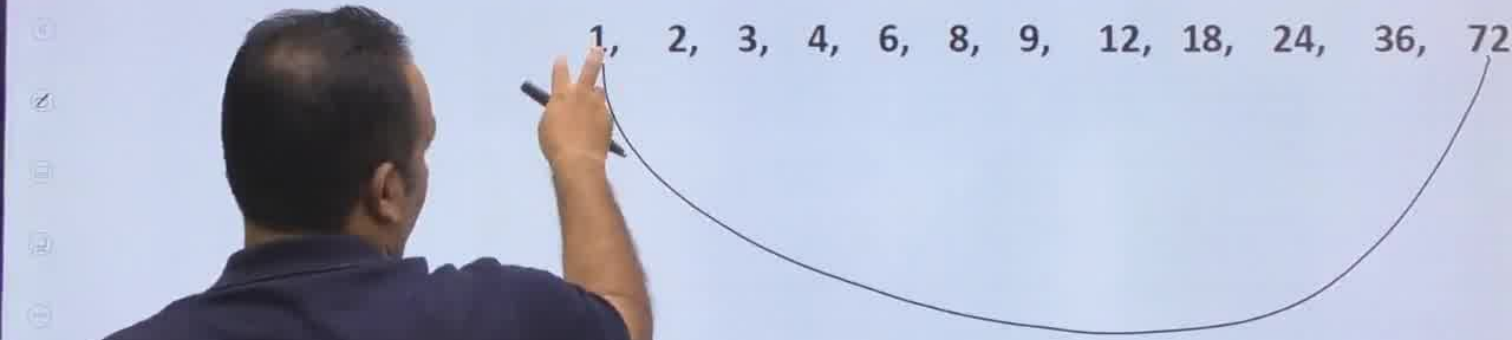
$= (1.72)(2.36)(3.24)(4.18)(6.12)(8.9) = (72)^6$

gradeup

Product of all the factors

$72 = 2^3 3^2$

1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72



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roduct of all the factors of 72

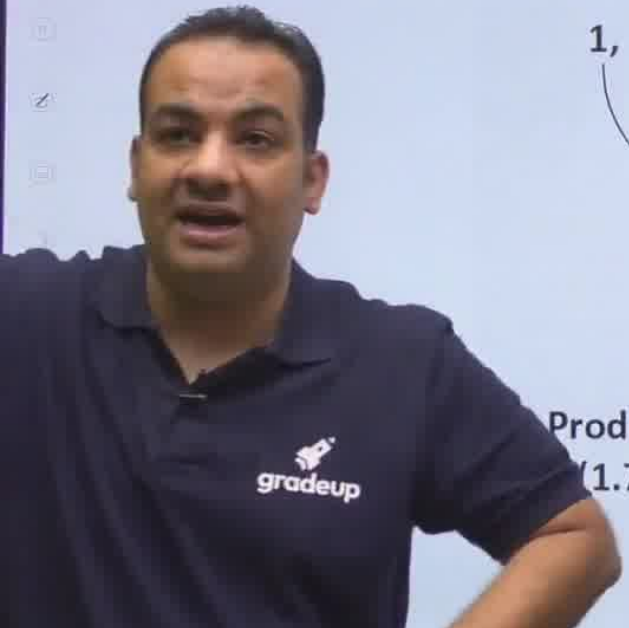
$= (1.72)(2.36)(3.24)(4.18)(6.12)(8.9) = (72)^6$

gradeup

Product of all the factors

$72 = 2^3 3^2$

1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72



Product of all the factors of 72

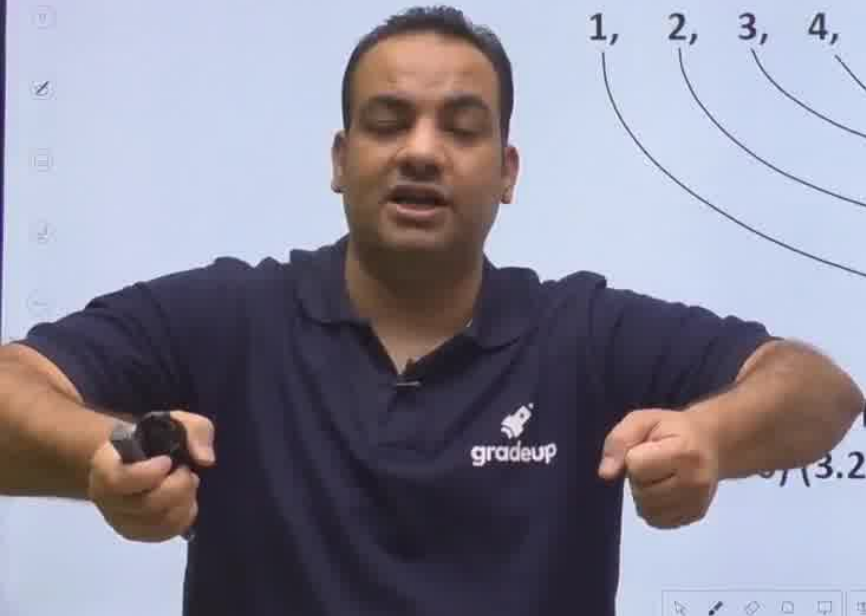
$(1.72)(2.36)(3.24)(4.18)(6.12)(8.9) = (72)^6$

gradeup

Product of all the factors

$72 = 2^3 3^2$

1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72



factors of 72

(3.24) (4.18) (6.12) (8 .9) = $(72)^6$

gradeup

Product of all the factors of N

Where $N = P_1^a P_2^b P_3^c$

n = number of factors of N

Product of all the factors of N

$= (N)^{\frac{n}{2}}$

gradeup

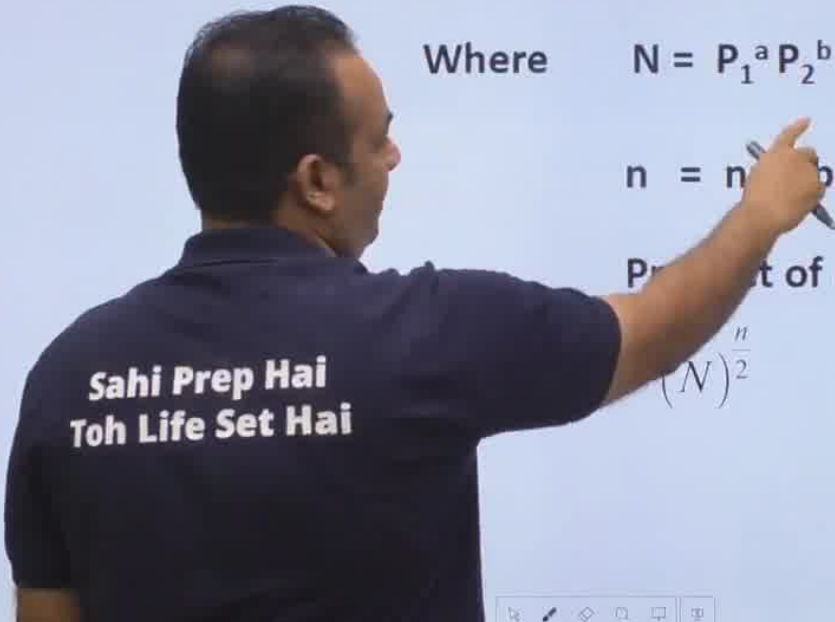
Product of all the factors of N

Where $N = P_1^a P_2^b P_3^c$

n = n...ber of factors of N

P...t of all the factors of N

$$(N)^{\frac{n}{2}}$$



gradeup

Product of all the factors of N

Where $N = P_1^a P_2^b P_3^c$

n = number of factors of N

Product of all the factors of N

$$(N)^{\frac{n}{2}}$$

gradeup

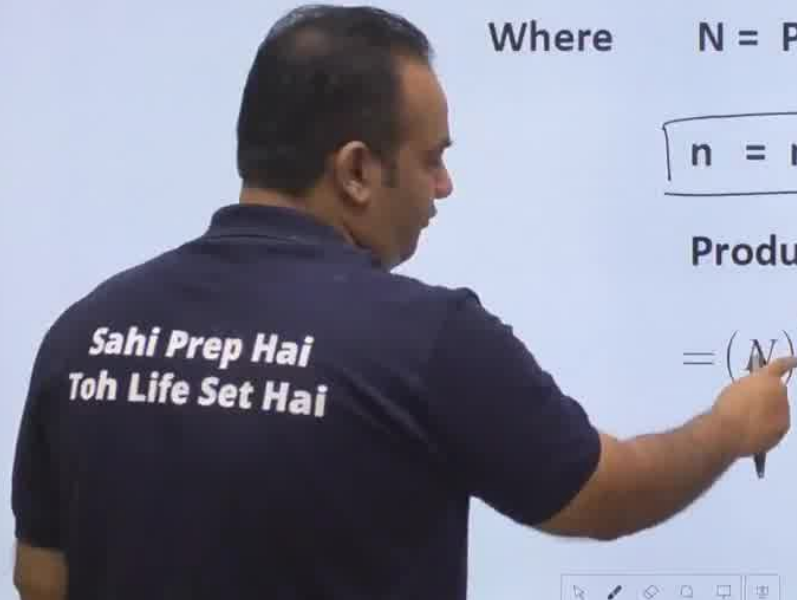
Product of all the factors of N

Where $N = P_1^a P_2^b P_3^c$

n = number of factors of N

Product of all the factors of N

$= (N)^{\frac{n}{2}}$

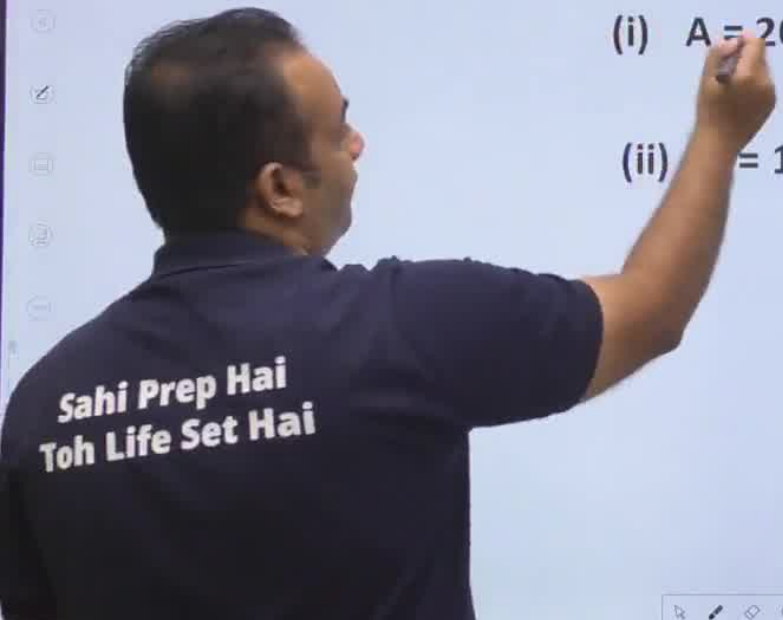


gradeup

Q. Find the product of all factors of

(i) A = 200

(ii) = 100

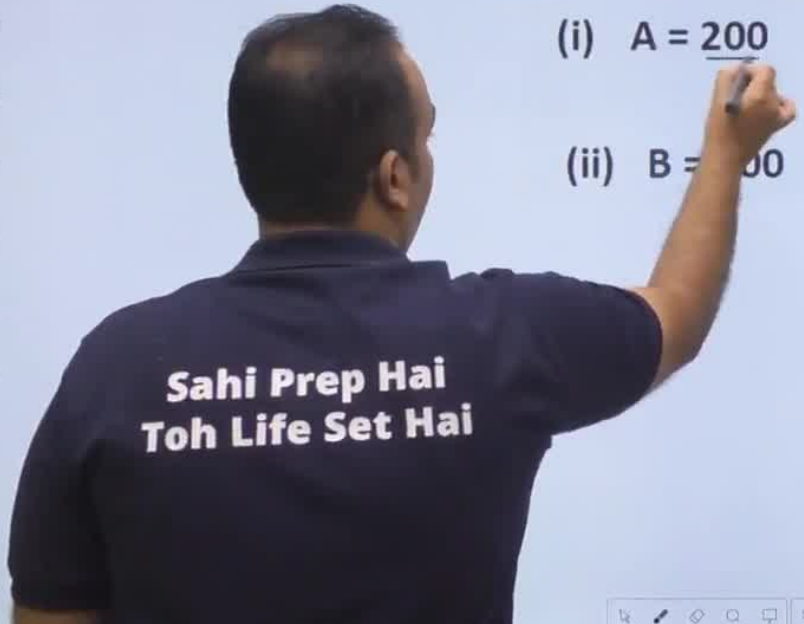


gradeup

Q. Find the product of all factors of

(i) A = 200

(ii) B = 00



gradeup

Q. Find the product of all factors of

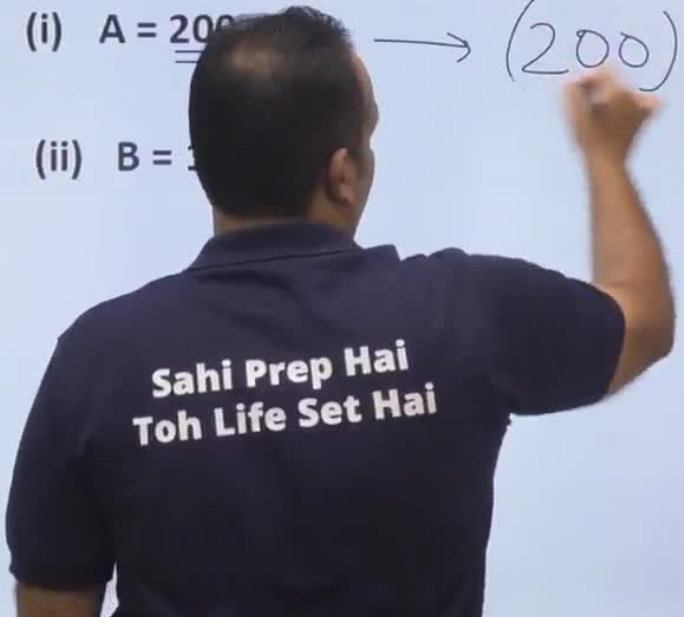
$200 = 2^3 5^2$

No. of Factors

$\longrightarrow 4 \times 3 = 12$

(i) A = 200 $\longrightarrow$ (200)

(ii) B = 1



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Q. Find the product of all factors of

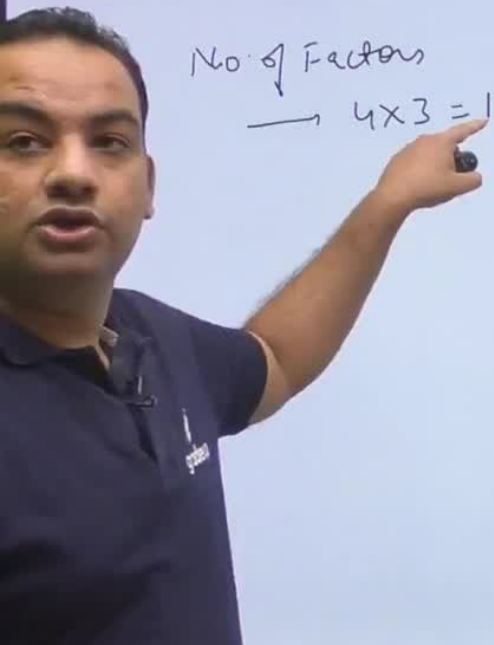
$200 = 2^3 5^2$

No of Factors

$\longrightarrow 4 \times 3 = 12$

(i) A = 200 $\longrightarrow$ (200)

(ii) B = 100



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Q. Find the product of all factors of

$200 = 2^3 5^2$

No. of Factors

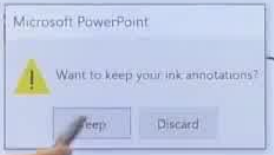
$\rightarrow 4 \times 3 = 12$

(i) $A = 200$ $\rightarrow (200)^6$

$100 = 2^2 5^2$

Factor = 9

(i



$\rightarrow (100)^{\frac{9}{2}}$

$\rightarrow (10^2)^{\frac{9}{2}}$

$= 10^9$

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$200 = 2^3 5^2$

No of Factors

$\longrightarrow 4 \times 3 = 12$

$100 = 2^2 5^2$

No of Factor = 9

Q. Find the product of all factors of

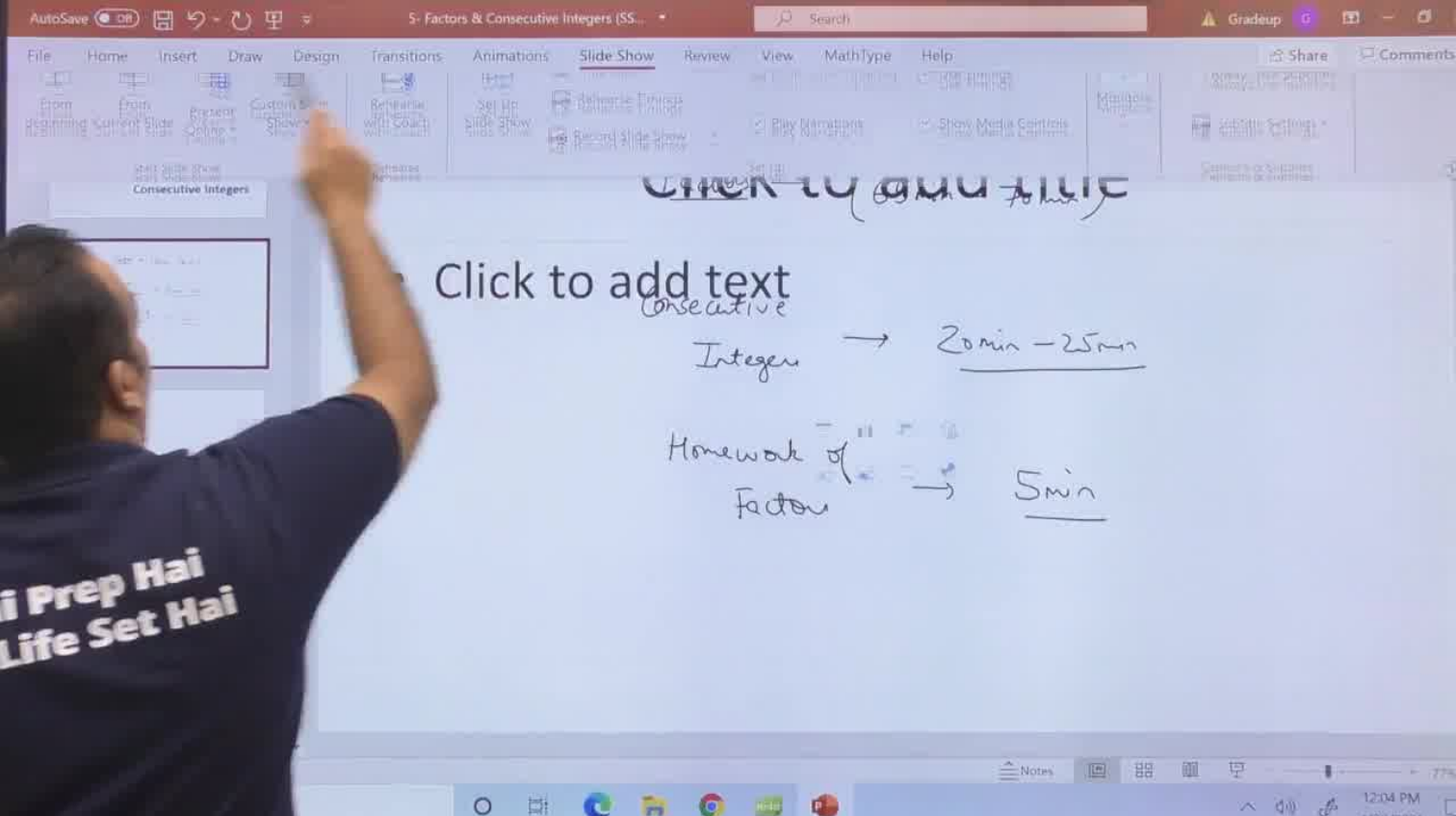
(i) A = 200 $\longrightarrow (200)^6$

(ii) B = 100

$\rightarrow (100)^{\frac{9}{2}}$

$\rightarrow (10^2)^{\frac{9}{2}}$

$= 10^9$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Set Up Slide Show
Rehearse Timings
Record Slide Show
Play Narrations
Show Media Controls
Consecutive Integers
Click to add text
Consecutive
Integers → 20min – 25min
Homework of Factors → 5min
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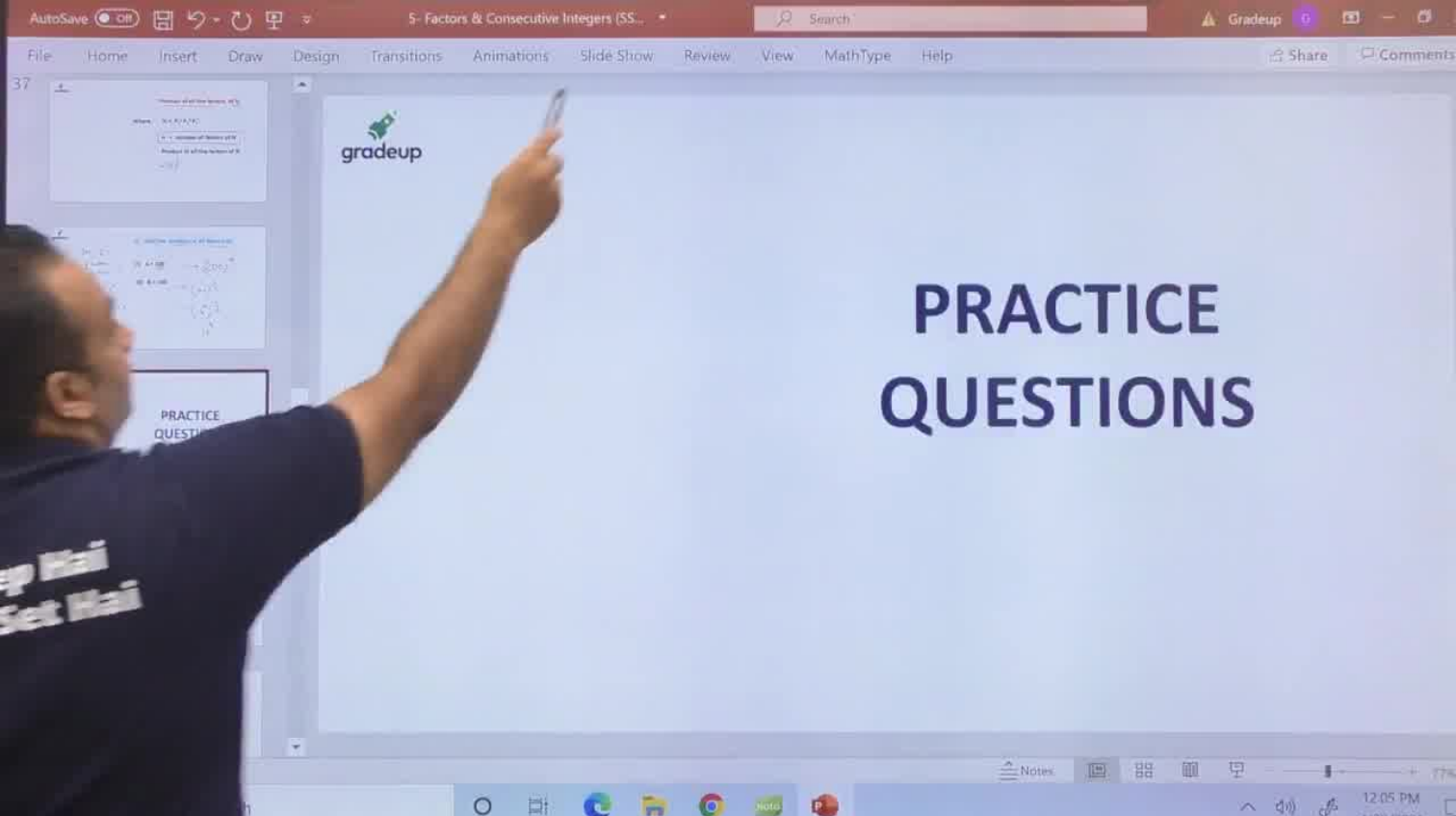
Factors → (65 min – 70 min)

nsecutive
Integers → 20 min – 25 min

Homework of
Factors → 5 min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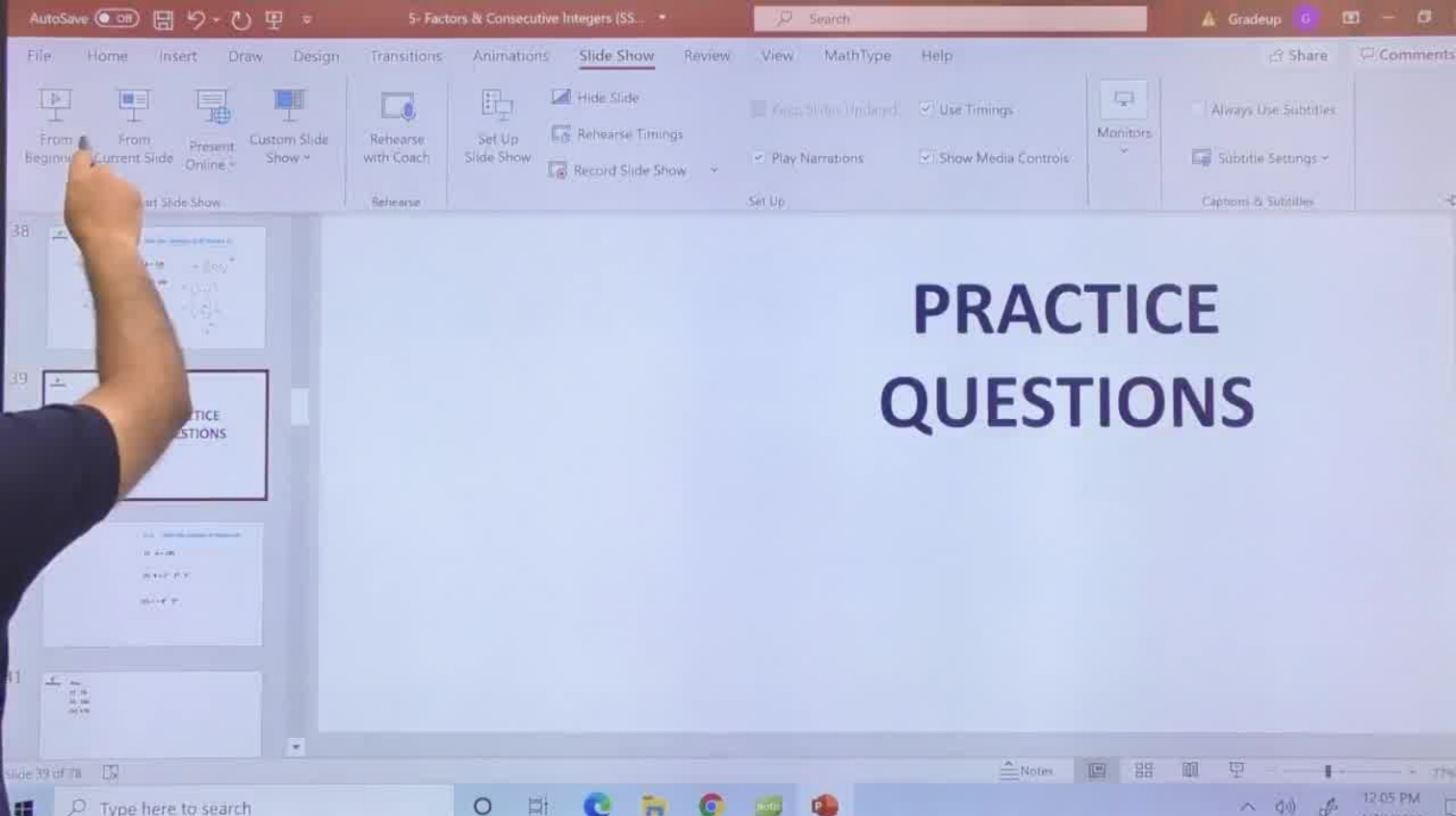
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Keep Slides Updated
Use Timings
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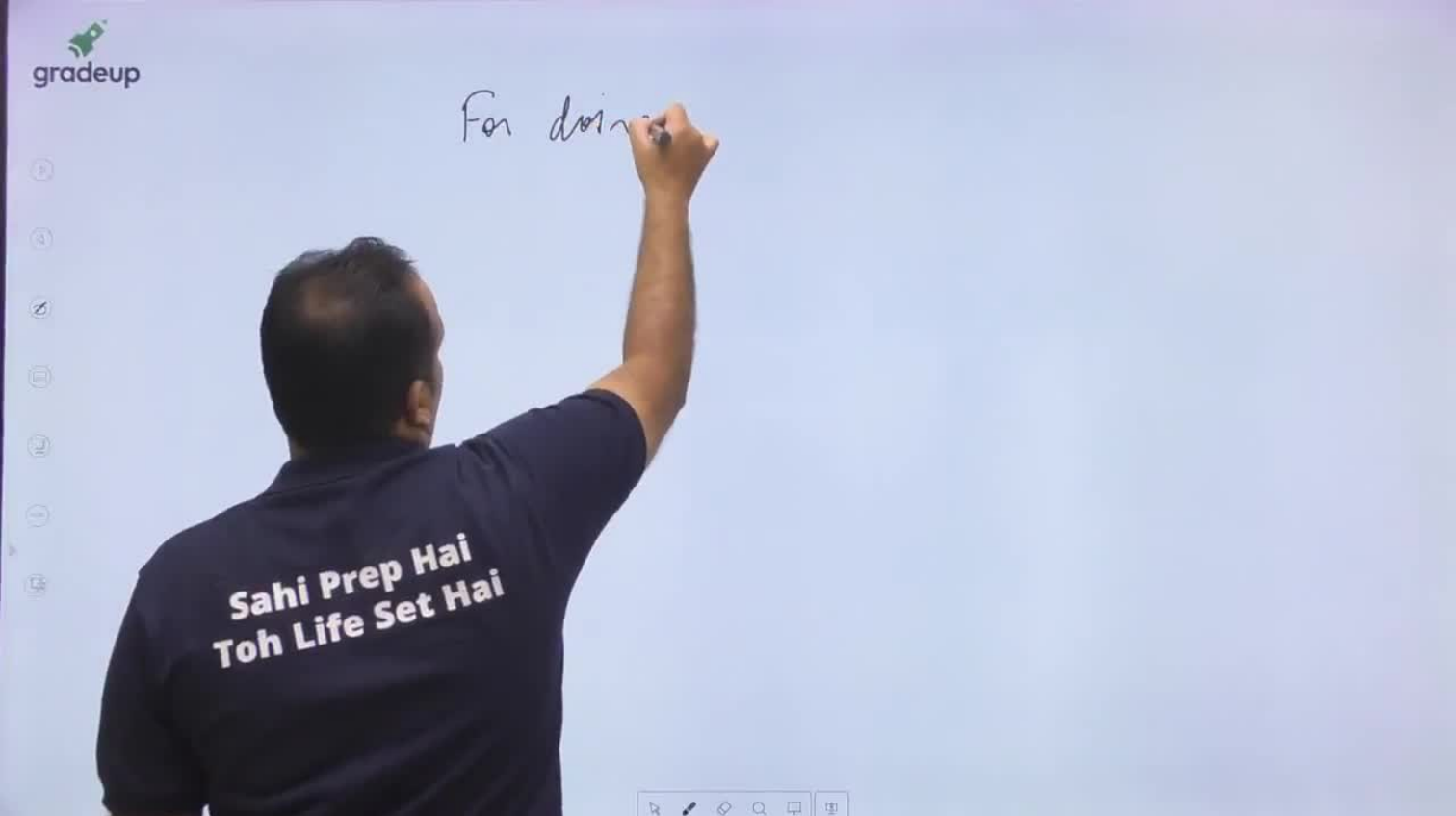
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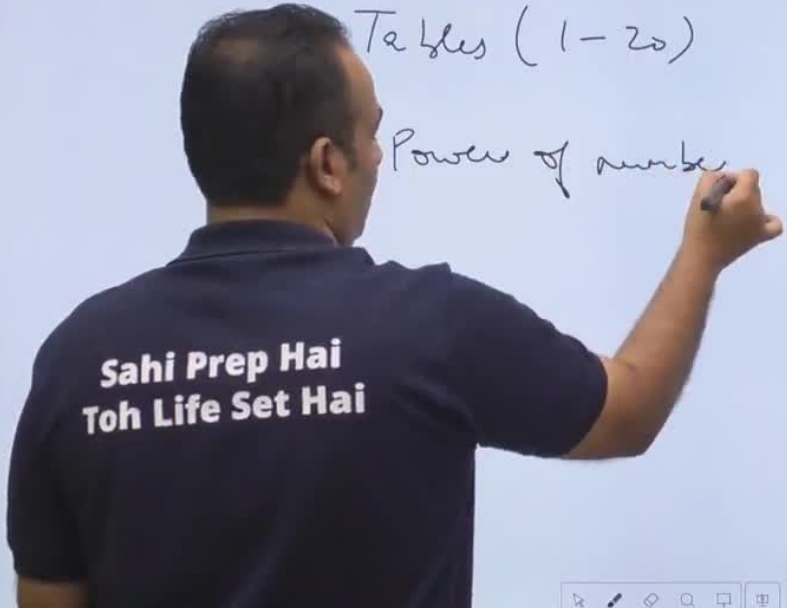
For doing Factorization Fast

Tables (1-20)

Power of numbe



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For doing Factorization Fast

→ Tables (1–20)

→ Power of numbers

$2^1 - 2^{10}$

$3^1 - 3^5$

$4^1 - $

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For doing Factorization Fast

→ T... (1-20)

→ ...of numbers

2^{10} $5^1 - 5^7$

5 $6^1 - 6^7$

7^1

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For doing Factorization Fast

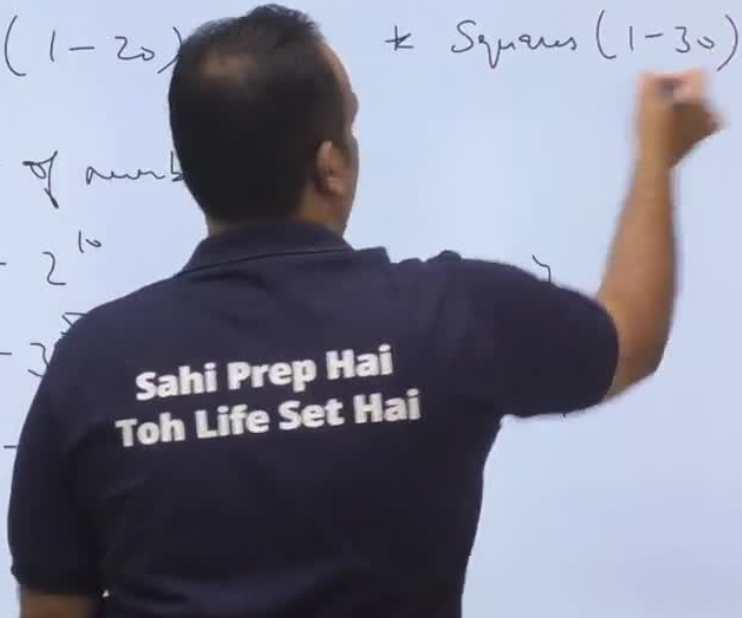
→ Tables (1-20) + Squares (1-30)

→ Power of numb

$2^1 - 2^{10}$

$3^1 - 3$

$4^1 -$



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For doing Factorization Fast

→ Tables (1-20) * Squares (1-30)

* Cubes (1-20)

→ Powers of numbers

$2^1 - 2^{10}$ $5^1 - 5^7$ $8^1 - 8^7$

$3^1 - 3^5$ $6^1 - 6^7$ $9^1 - 9^4$

$4^1 - 4^5$ $7^1 - 7^4$

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eg 360

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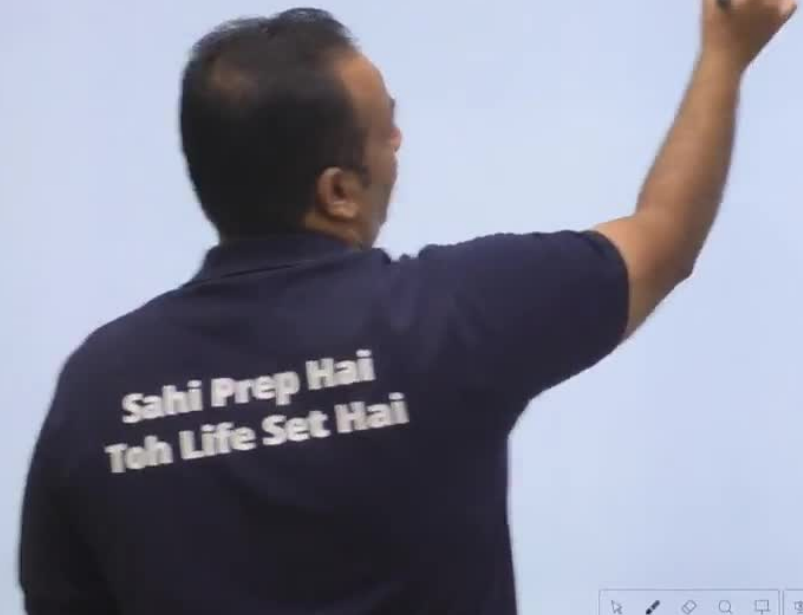
eg $360^\circ = 2$ 5



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eg $36 = 2^2 \quad 5^2$

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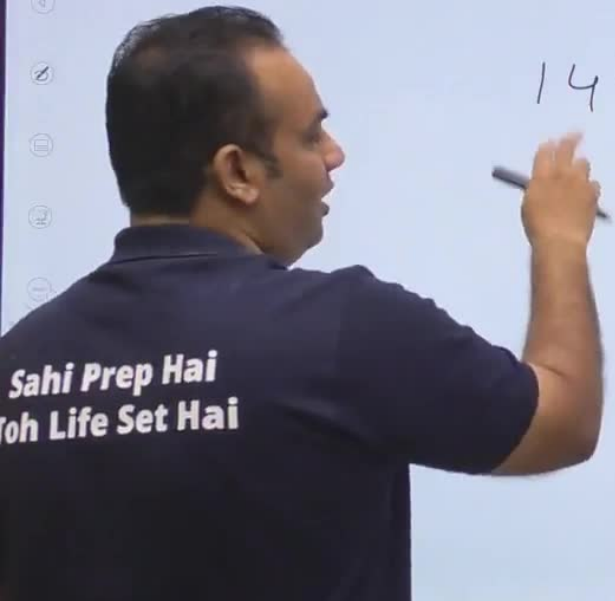
eg $360 = 2^3 \times 3^2 \times 5^1$

$1480 = 2^3 \times 5^1$



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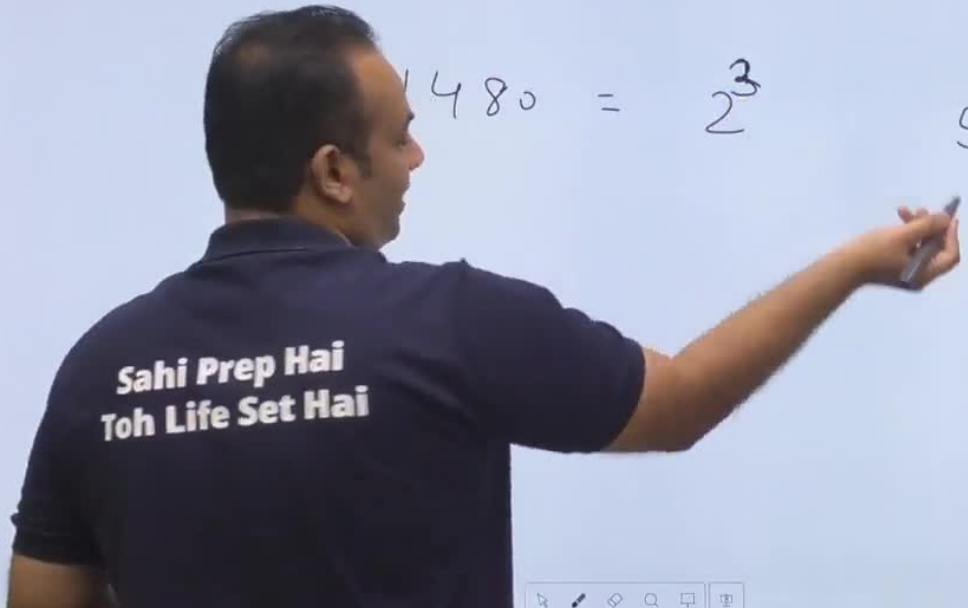
eg $360 = 2^2 \times 3^2 \times 5^1$

$1480 = 2^3 \times 5^1$



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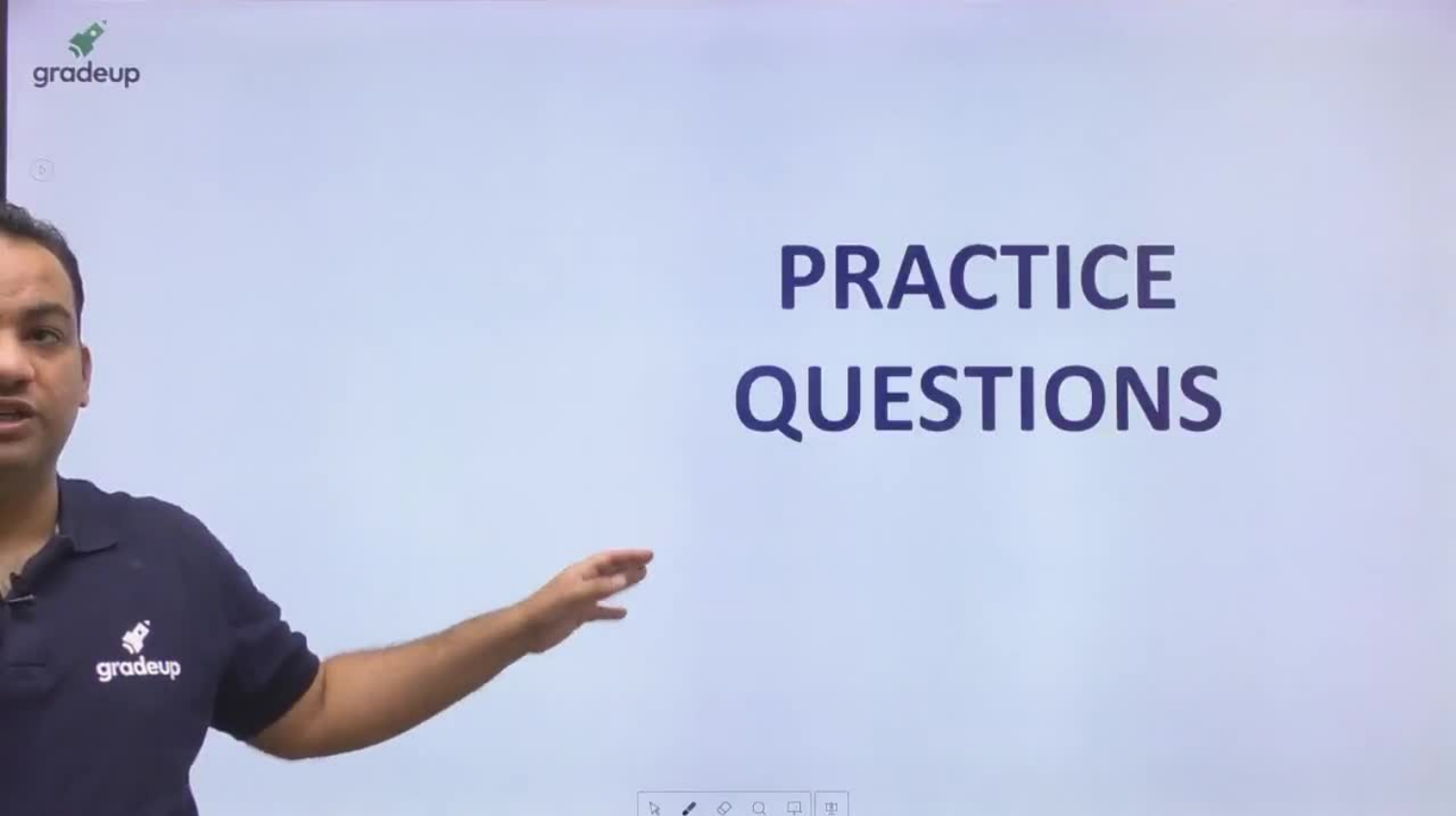
eg $3600 = 2^4 \, 3^2 \, 5^2$

$1480 = 2^3 \, 5^1 \, 37^1$

$324 = 2^2 \, 3^4$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CONSECUTIVE INTEGERS

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Consecutive Integers

If there are n consecutive integers then there must be exactly one integer which is completely divisible by n. If we take 3 consecutive integers, then there must be exactly one integer which is divisible by 3.

Example:	14, **15**, 16	15 is divisible by 3
	48, 49, 50	48 is divisible by 3
	67, 68, **69**	69 is divisible by 3

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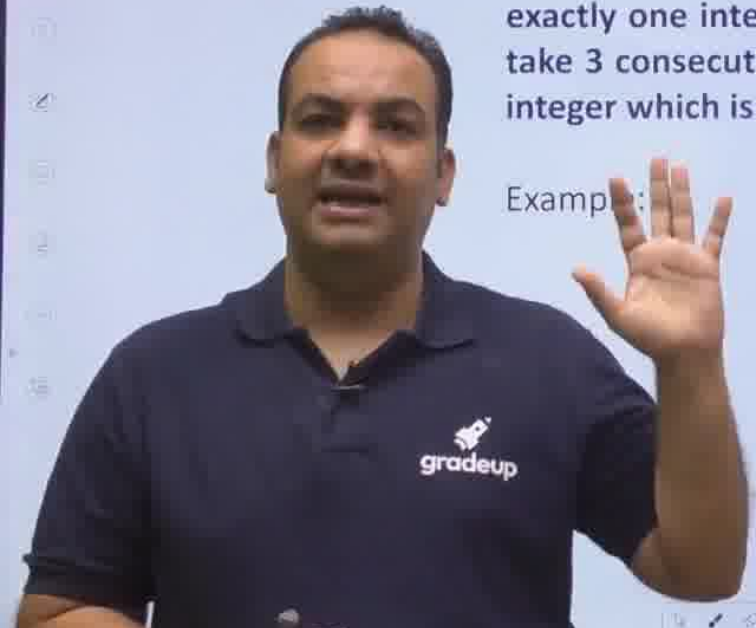

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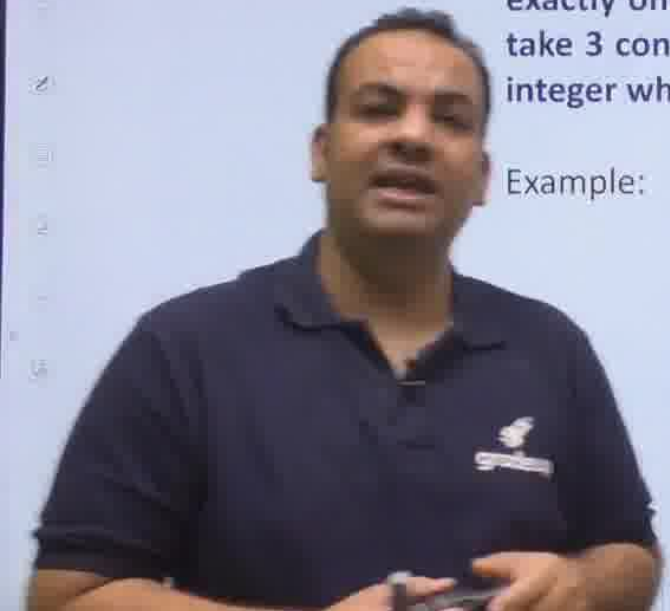

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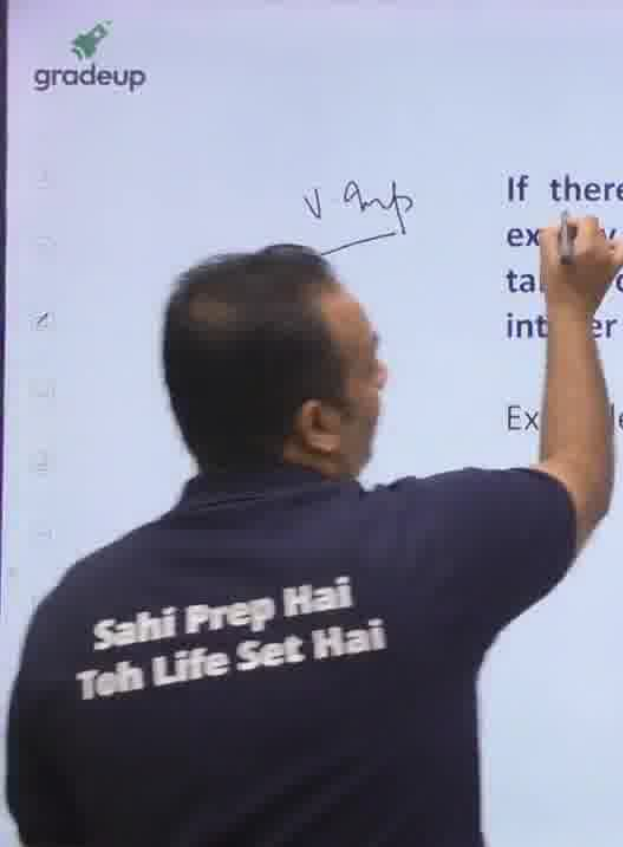

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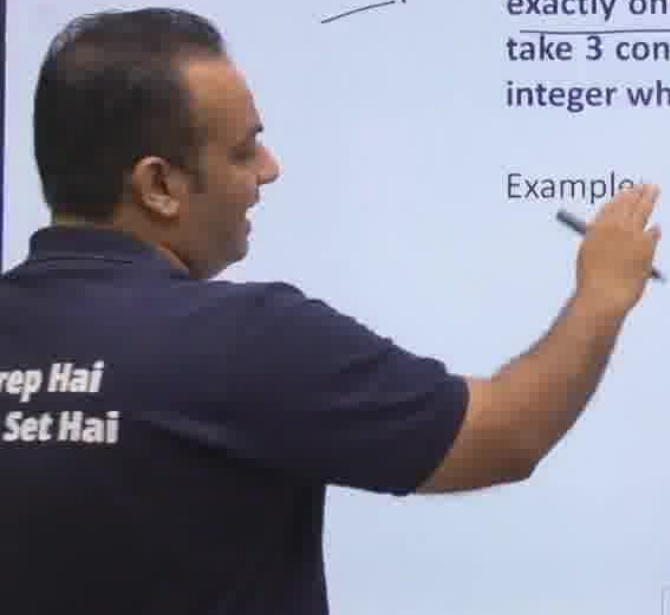

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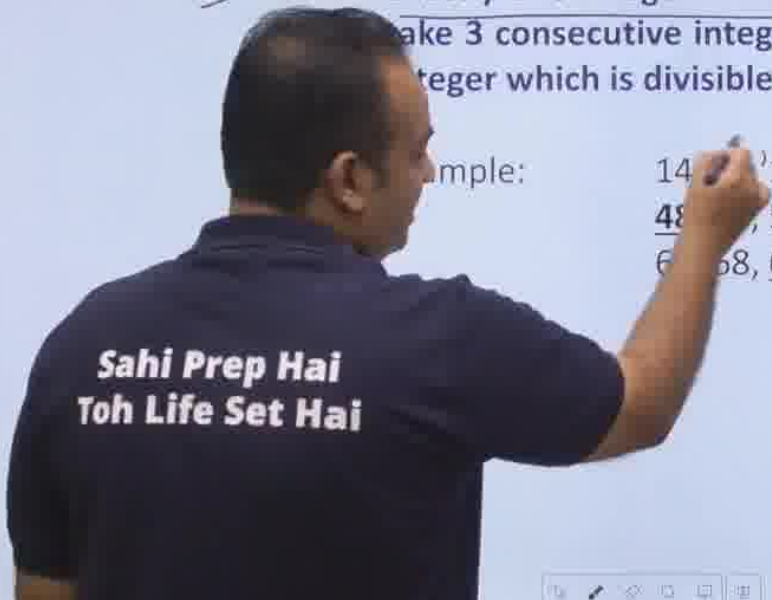

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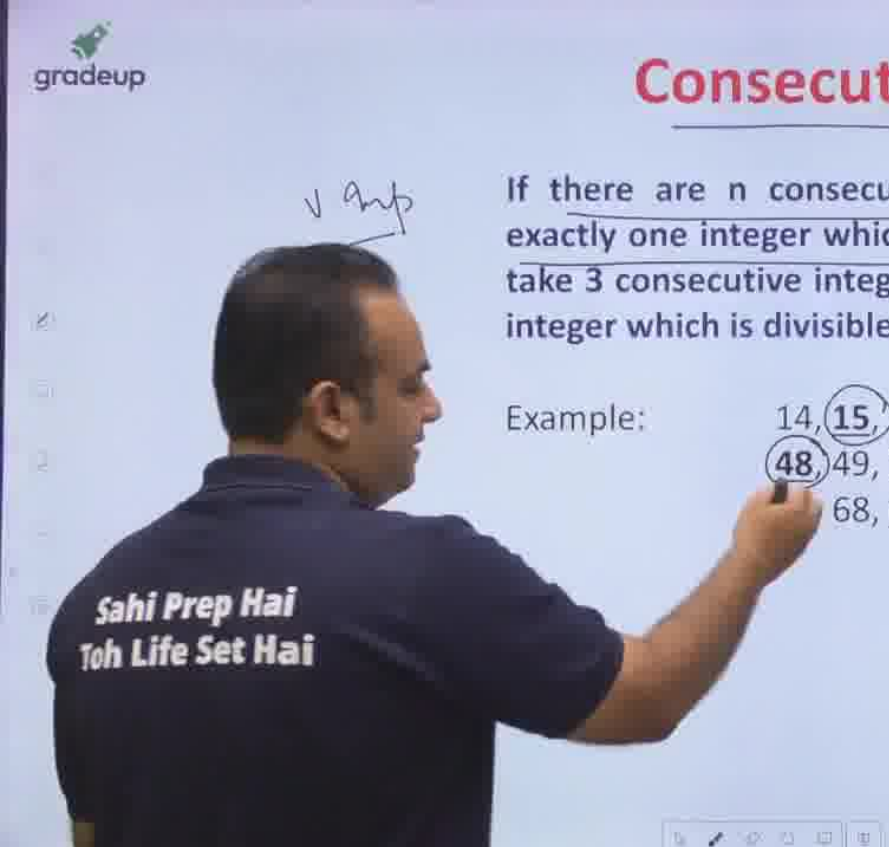

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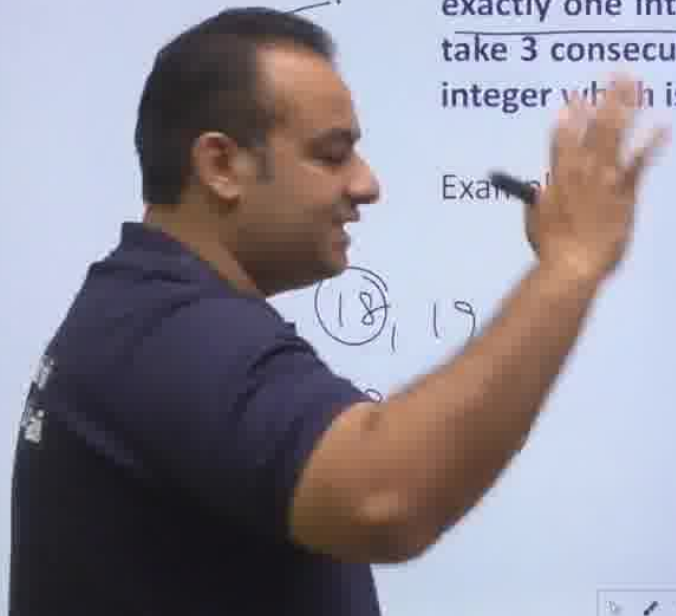

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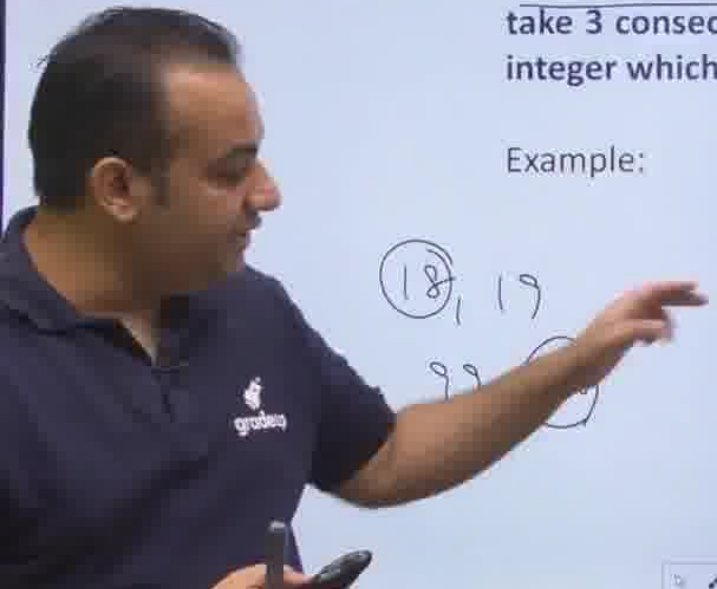

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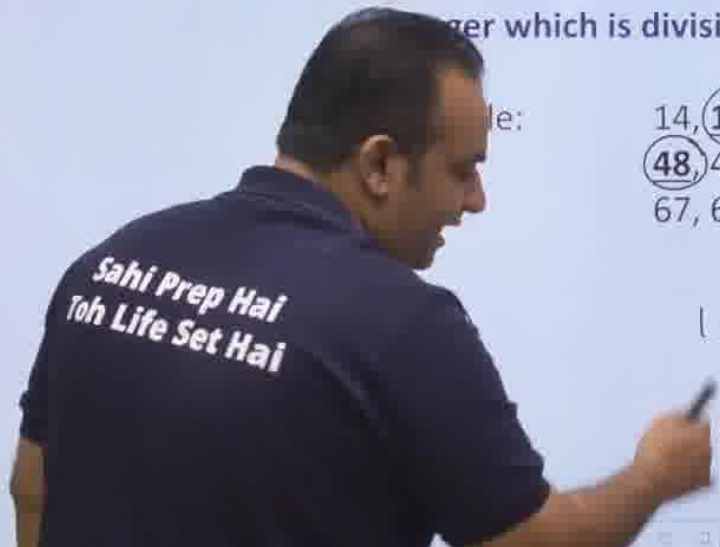

15, 16, 17, 18

58, 59, 60, 61

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Q. The product of 3 consecutive natural numbers is always divisible by _____.

Ans in this question, there are 3 consecutive natural number so o**r**mber must be divisible by 3 and atleast one number is divisible b**y**

e product of the numbers must be divisible by $3 \times 2 = 6$

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t Hai

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Q. Find the largest natural number which completely divides the product of 4 consecutive natural number ?

Ans: Let us take 4 consecutive natural number as x, x+1, x+2, x+3. Out of these 4 numbers atleast one is divisible by 3 and two must be even. As there are 2 consecutive even numbers, so one number out of them must be divisible by 4.

So we can say that the product of 4 consecutive natural number is divisible by $3 \times 2 \times 2 \times 2 = 24$

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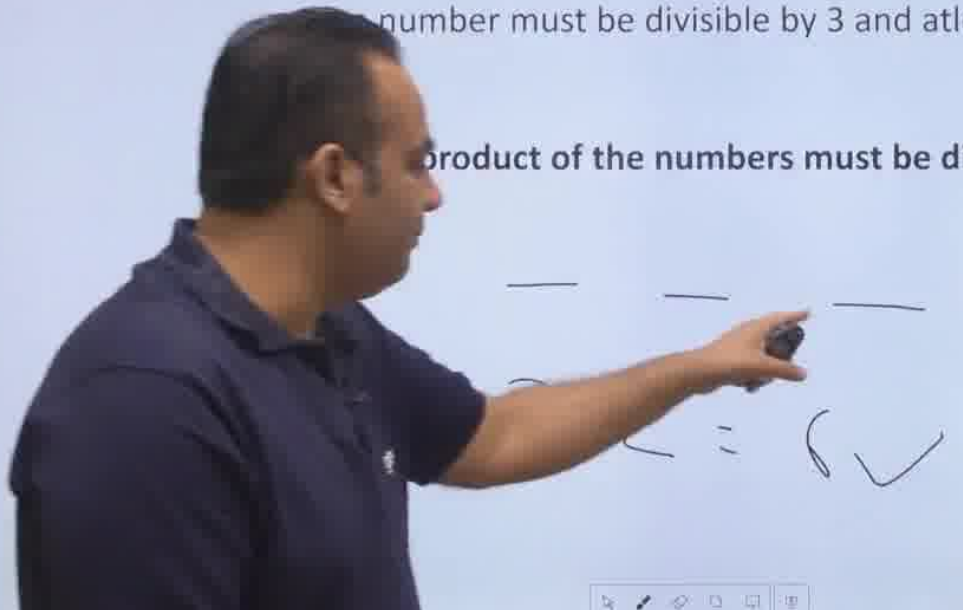

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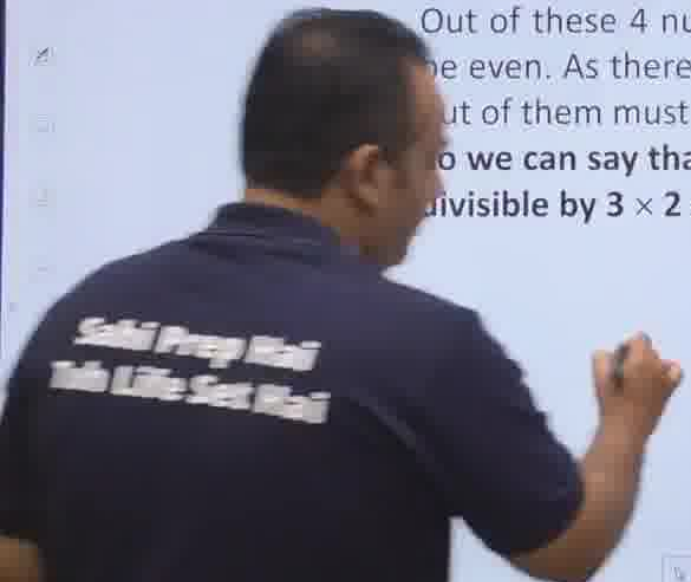

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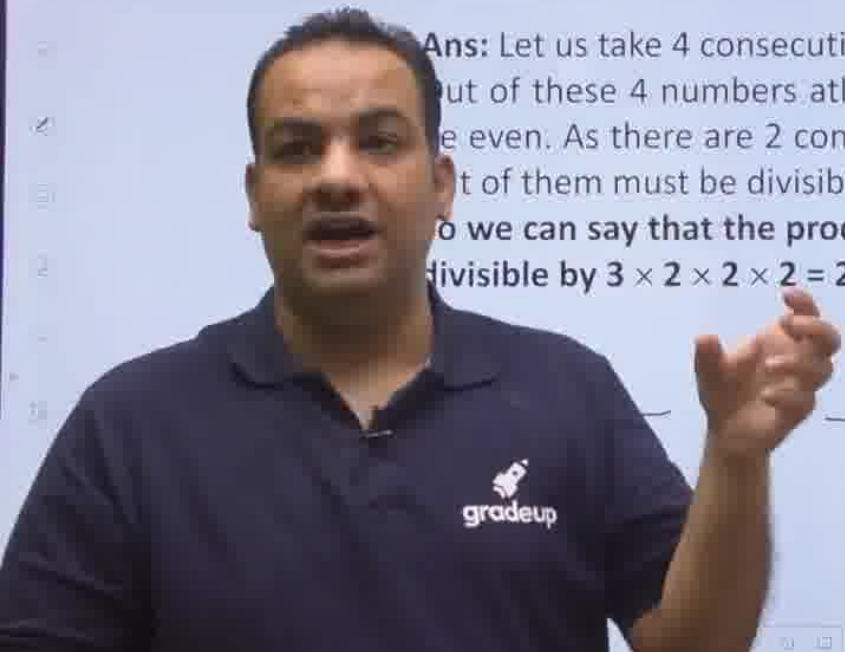

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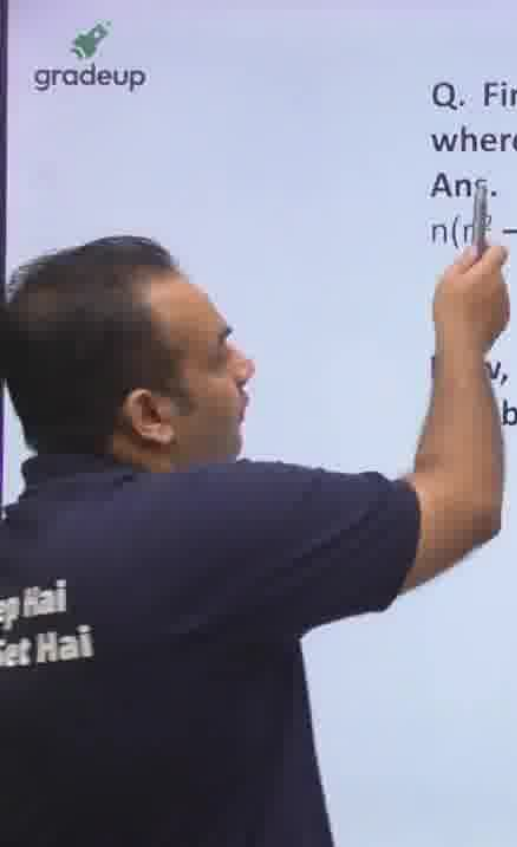
Q. Find the largest value of K which always divides $n(n^2 - 1)$ where n is a natural number.

Ans.

$n(n^2 - 1) = n(n - 1)(n + 1)$

$= (n - 1)(n)(n + 1)$

(n-1), (n) and (n+1) are three consecutive natural numbers so their product must be divisible by 6.



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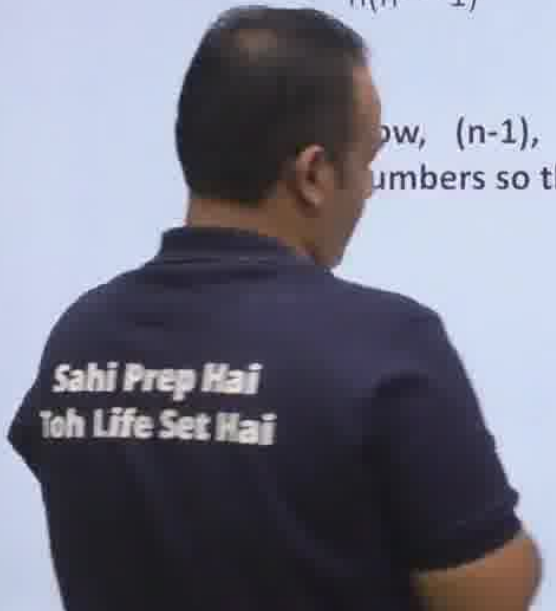

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1.If n is an integer , $(n^3 - n)$ is divisible by:

(A) 4
(B) 5
(C) 6
(D) 7

I

$n = 1$

$1^3 - 1 = 0$

$n = 2$

$2^3 - 2 = 6$

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1.If n is an integer , $(n^3 - n)$ is divisible by:

(A) 4
(B) 5
(C) 6
(D) 7

$n = 1$

$1^3 - 1 = 0$

$n = 2$

$2^3 - 2 = 6$

II Concept

$n(n^2 - 1)$

$n(n-1)(n+1)$

$(n-1)(n)(n+1)$

6

gradeup

Ans. (C)

$n^3 - n$

$= n(n^2 - 1)$

$= n(n - 1)(n + 1)$

$= (n - 1)(n)(n + 1)$

As this is a product of 3 consecutive integers, so atleast one integer will be divisible by 2 and exactly one integer will be divisible by 3, so the product is divisible by 6.

OR

You can put values and eliminate the options.

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2. Find the largest number which always divides the expression $(n^3-n)(n-2)$, where n is a natural number greater than 2?

(A) 6 (B) 12

(C) 24 (D) 48

gradeup

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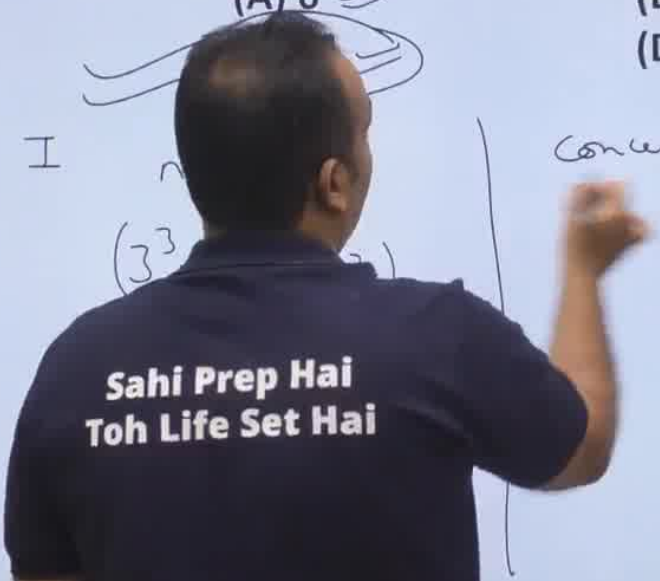
(A) 6 (B) 12

(D) 48



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(A) 6 (B) 12

(C) (D) 48

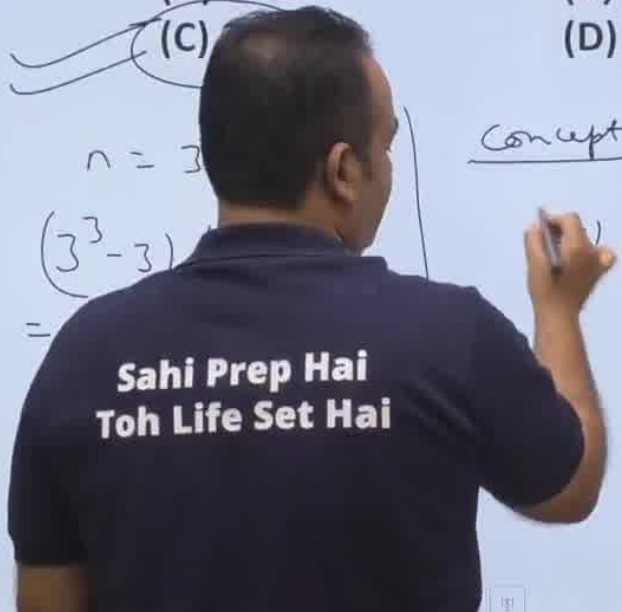
I $n = 3$

(3^3-3)

$=$

Concept

n



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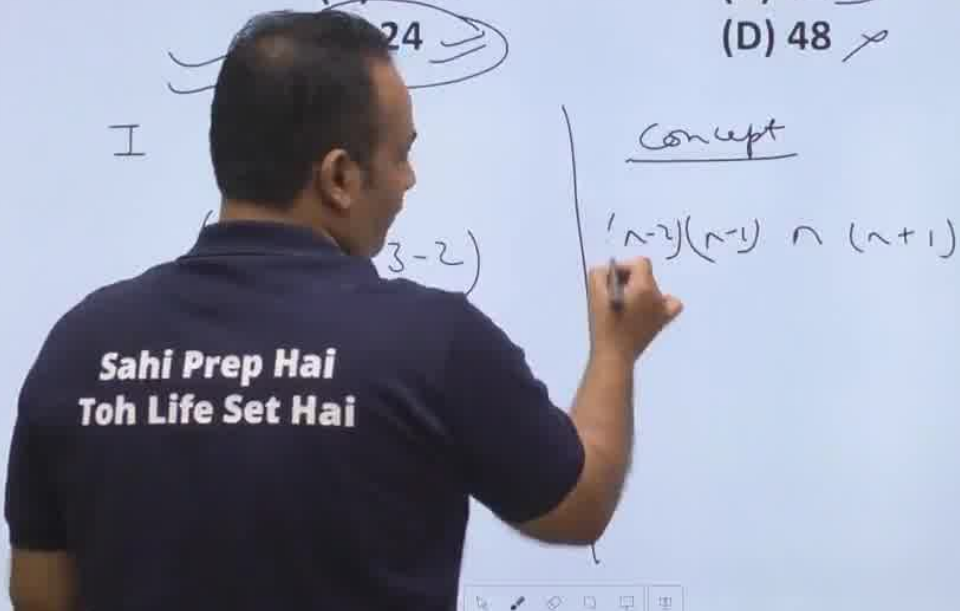

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(A) 6 (B) 12

(C) 24 (D) 48

I

$n = 3$

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

$= 24$

$n = 4$

$60-2 = 12$

Concept

$(n-2)(n-1)\,n\,(n+1)$

$\rightarrow 24$

gradeup

Ans. (C)

$(n^3 - n)(n - 2)$

$= n(n^2 - 1)(n - 2)$

$= n(n - 1)(n + 1)(n - 2)$

$= (n - 2)(n - 1)(n)(n + 1)$

Product of 4 consecutive integers is divisible by $1.2.3.4 = 24$

OR

You can put values starting from $n = 3$

If $n = 3$

$(27 - 3)(3 - 2) = 24$ divisible by 24

If $n = 4$

$(60)(21) = 120$ divisible by 24

gradeup

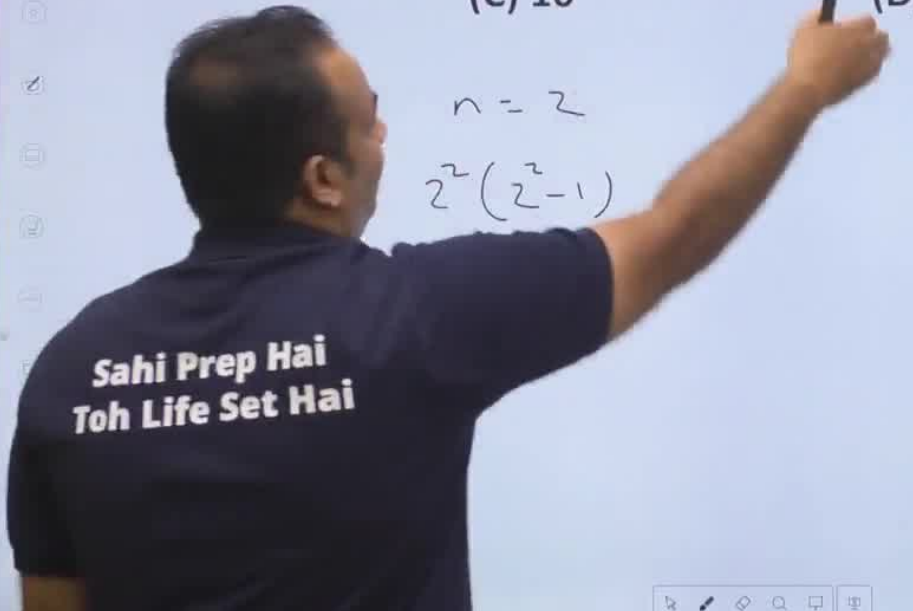
3. If n is a natural number greater than 1 then $n^2(n^2-1)$ is, always divisible by which of the following?

(A)16 (B) 12

(C) 10 (D) 8

$n = 2$

$2^2(2^2-1)$



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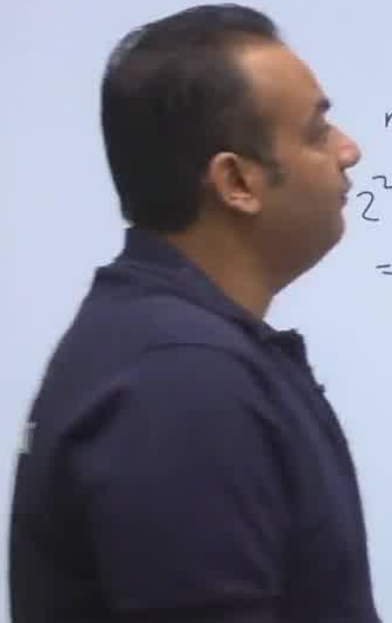
$2^2(2^2-1)$

$= 12$



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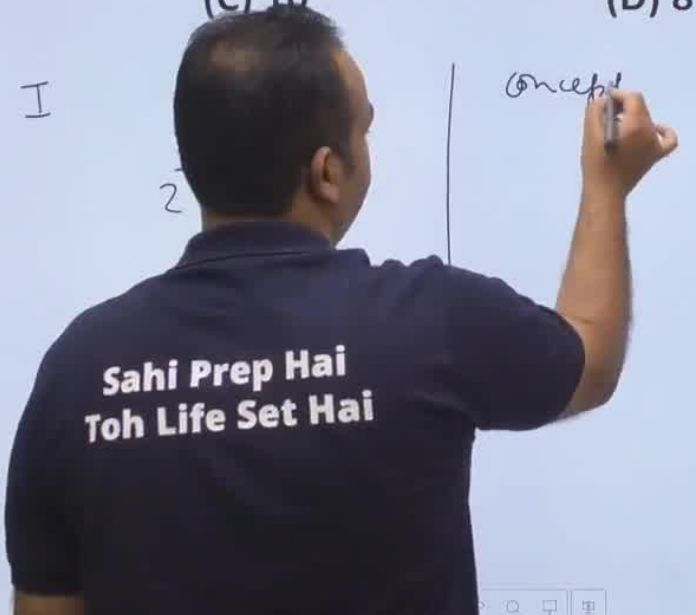

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$n = 2$

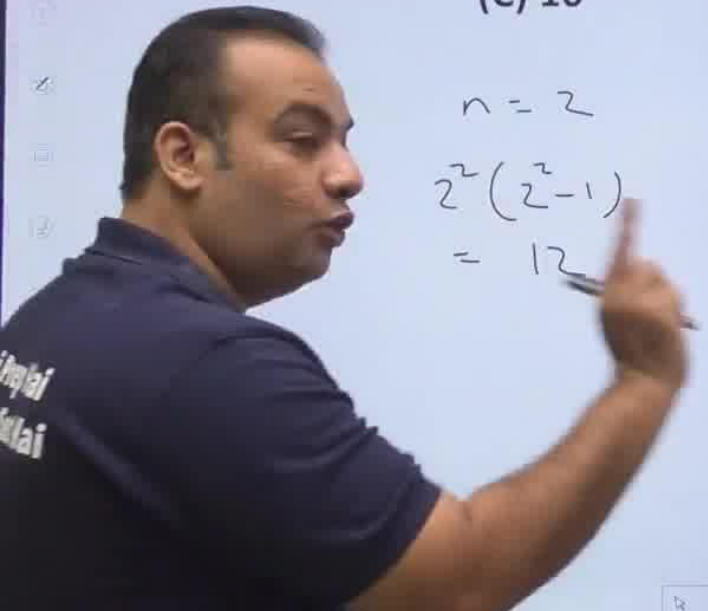
$2^2(2^2-1)$

$= 12$

Concept

$n \cdot n(n-1)(n+1)$

$[(n-1) \cdot (n)(n+1)]\ n$



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3. If n is a natural number greater than 1 then $n^2(n^2-1)$ is, always divisible by which of the following?

(A)16 (B) 12

(C) 10 (D) 8

I

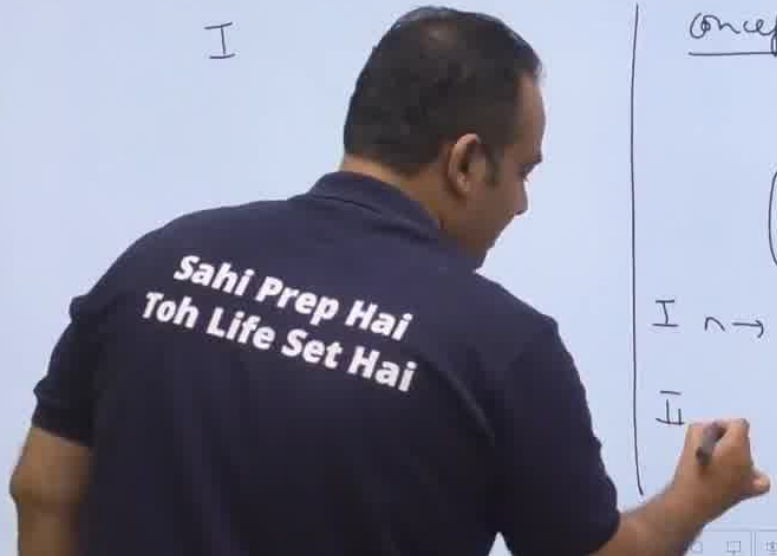
Concept

$n \cdot n(n-1)(n+1)$

$[(n-1) \cdot (n) (n+1)] \, n$

I $n \rightarrow$ odd

II



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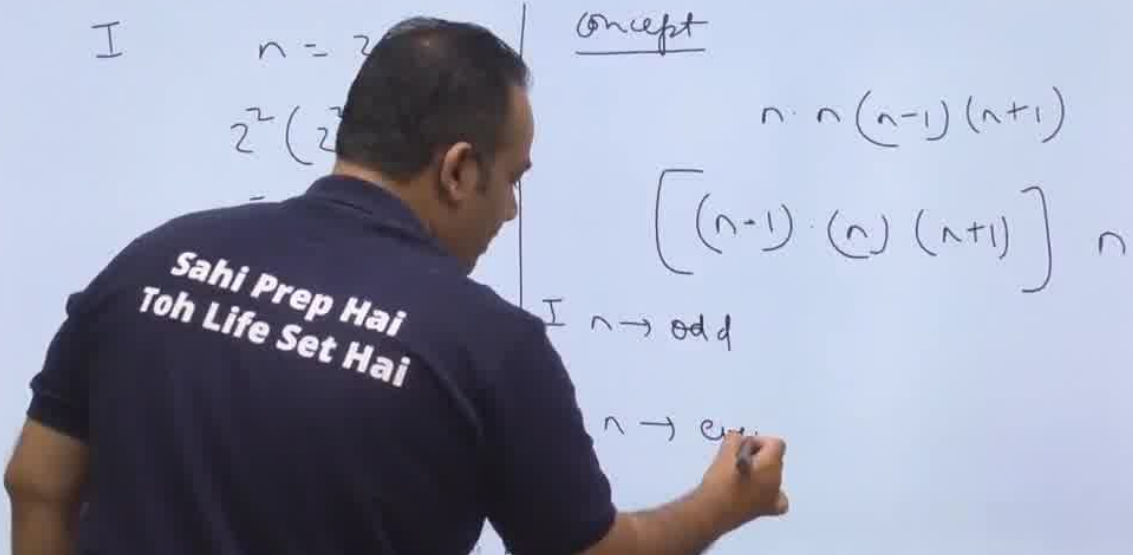

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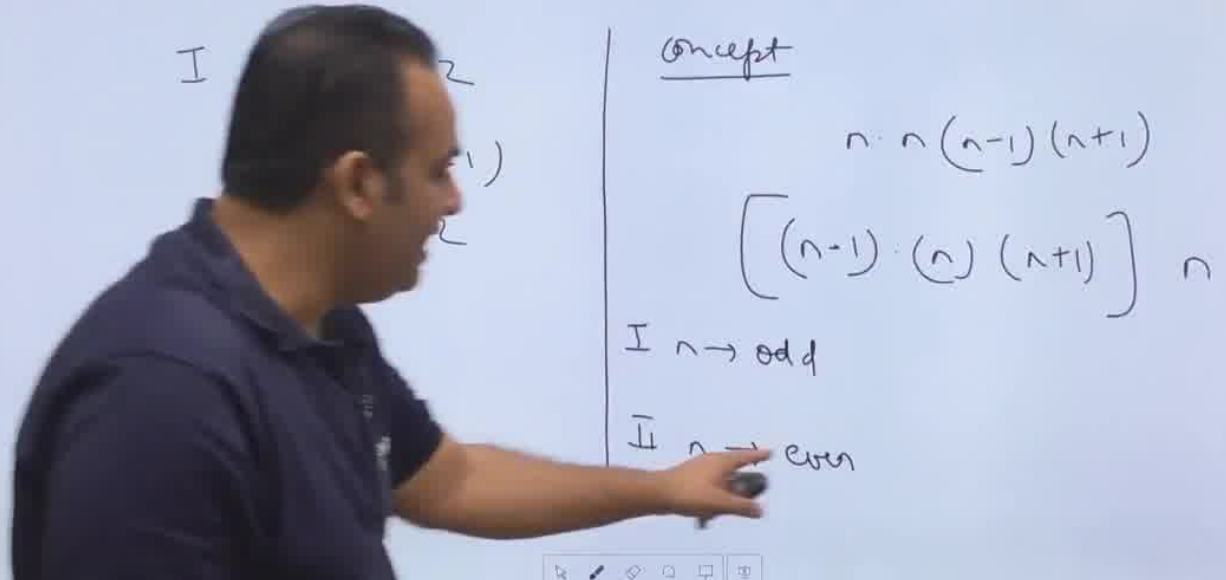

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3. If n is a natural number greater than 1 then $n^2(n^2-1)$ is, always divisible by which of the following?

(A)16 (B) 12

(C) 10 (D) 8

I

2

Concept

$n \cdot n(n-1)(n+1)$

$[(n-1) \cdot (n) (n+1)] \, n$

I $n \rightarrow$ odd

$n \rightarrow$ even

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3. If n is a natural number greater than 1 then $n^2(n^2-1)$ is, always divisible by which of the following?

(A)16 (B) 12

(C) 10 (D) 8

= 2

(2^2-1)

12

Concept

$n \cdot n(n-1)(n+1)$

$[(n-1)\cdot(n)(n+1)]\ n$

I → odd

→ even

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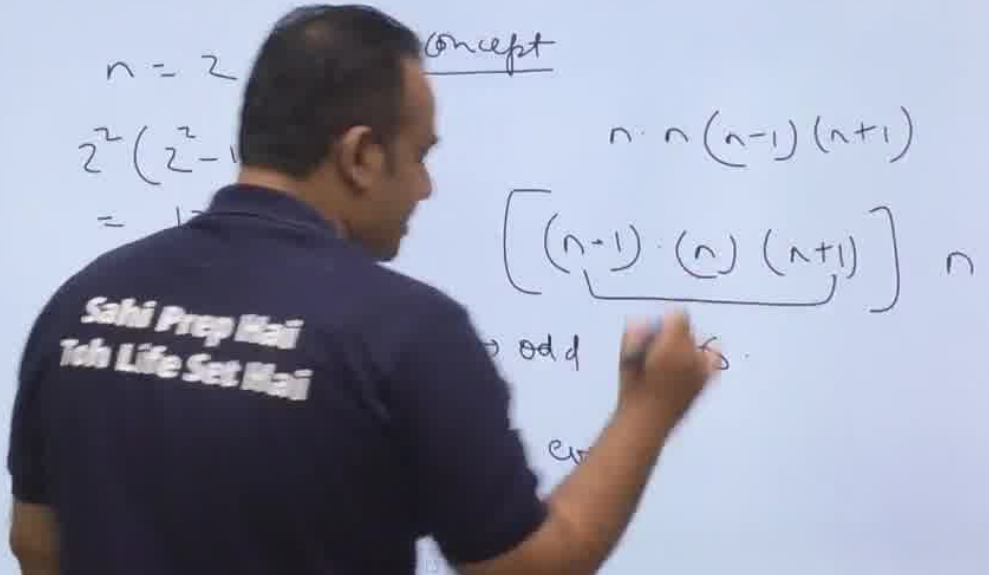

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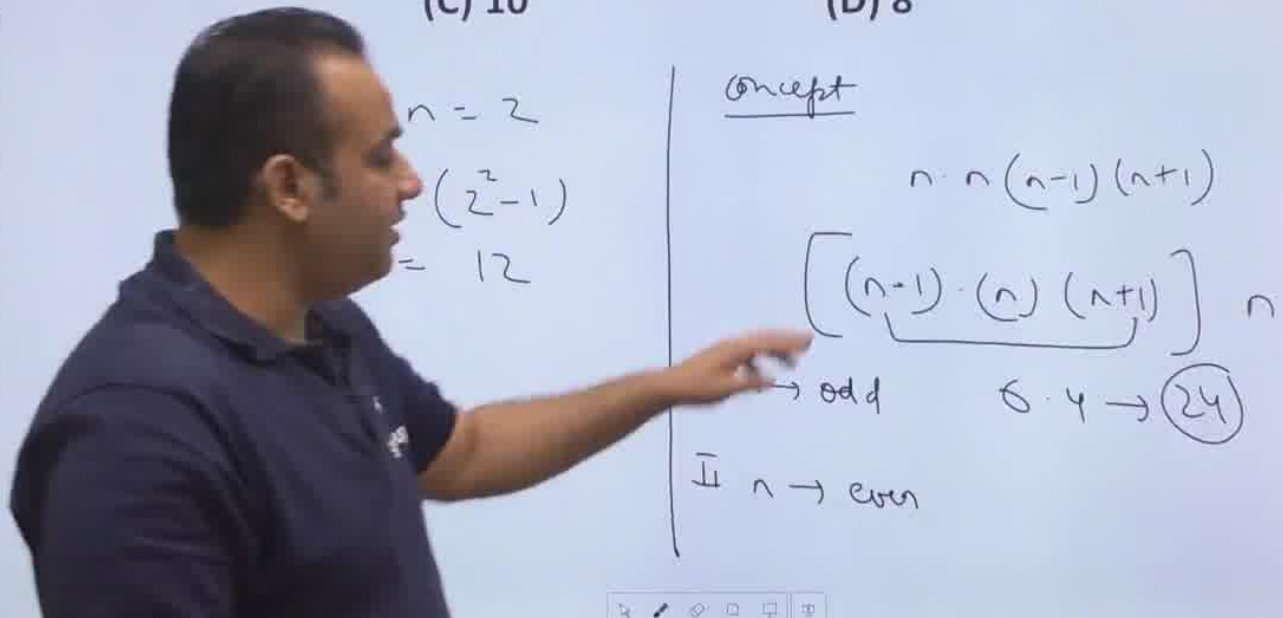

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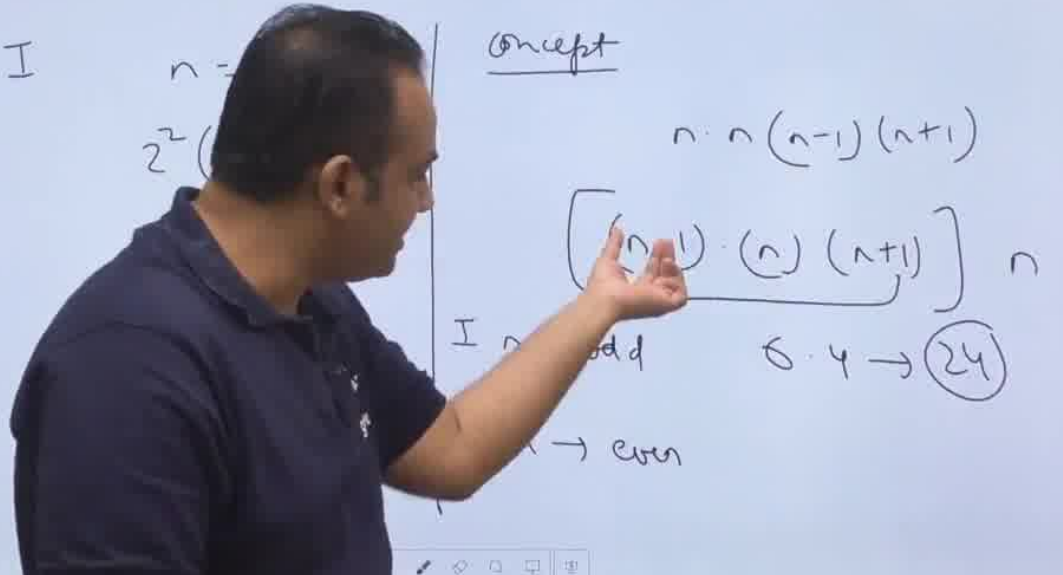

gradeup

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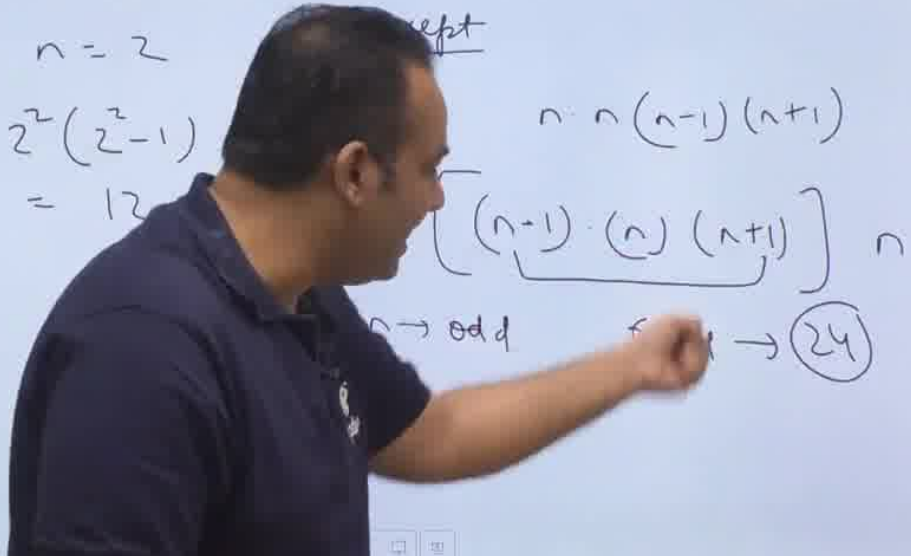

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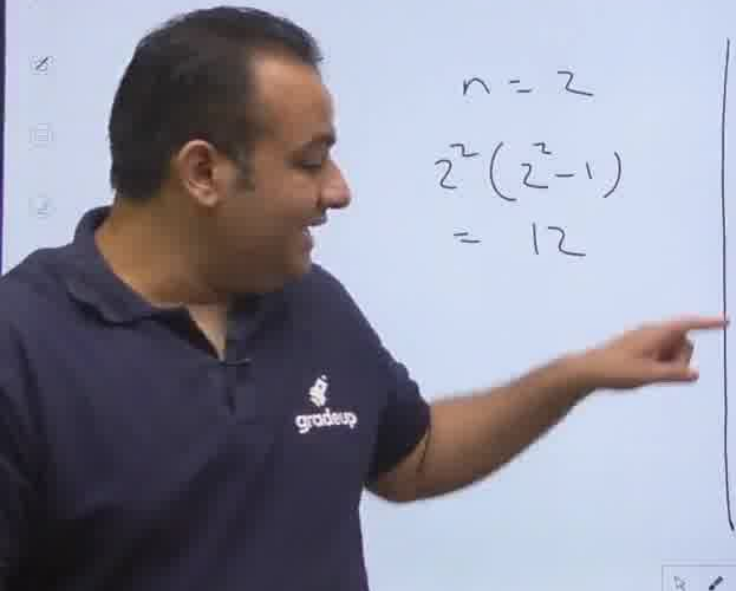
(A)16 **(B) 12**

(C) 10 **(D) 8**



$n = 2$

$2^2(2^2-1)$

$= 12$

Concept

$n \cdot n(n-1)(n+1)$

$[(n-1)\cdot(n)\cdot(n+1)]\,n$

I $n \rightarrow$ odd $\quad 6 \cdot 4 \rightarrow (24)$

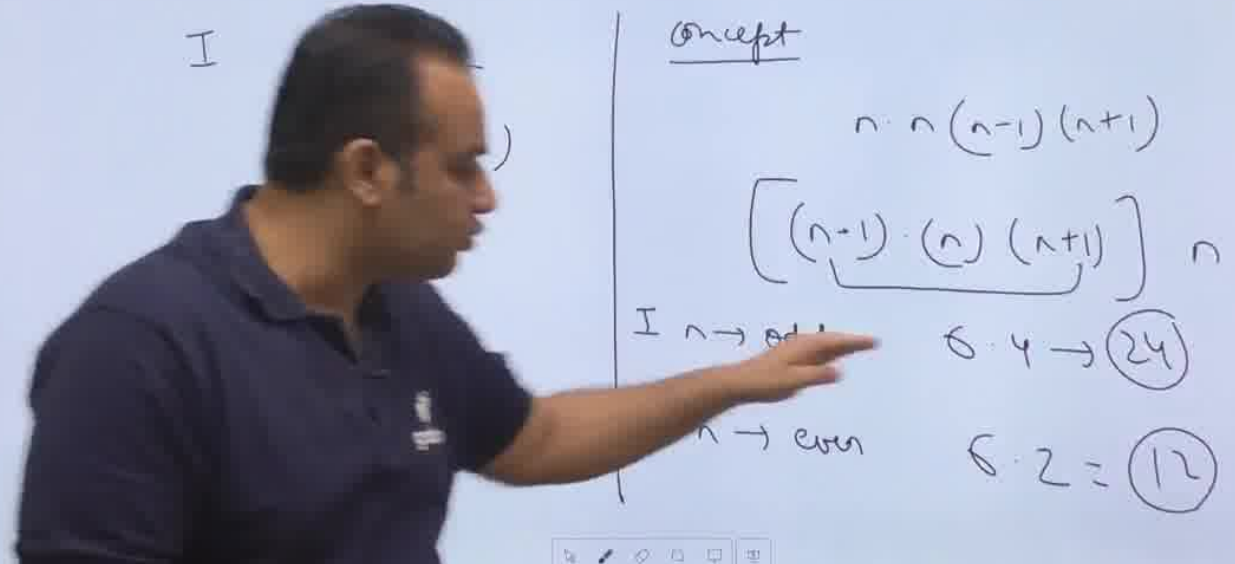
II $n \rightarrow$ even $\quad 6 \cdot 2 = (12)$

gradeup

3. If n is a natural number greater than 1 then $n^2(n^2-1)$ is, always divisible by which of the following?

(A)16 (B) 12

(C) 10 (D) 8



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Ans. (B)

$n^2 (n^2 - 1)$

$= n^2 (n - 1) (n + 1)$

$n. (n - 1) (n) (n + 1)$

As $n > 1$

Case I : When n is odd

$n . \underbrace{(n - 1) (n) (n + 1)}$

If n is odd we know that produce of 3 consecutive integers is divisible by 6, but if n is odd then $(n - 1)$ and $(n+1)$ both are even, so we get one extra multiple of 2. So, product is divisible by 12.

Case II : If n is even

$n . \underbrace{(n - 1) (n) (n + 1)}$

$2 . 6 = 12$

gradeup

4. Find the largest natural number which always completely divides the product of four consecutive natural number.

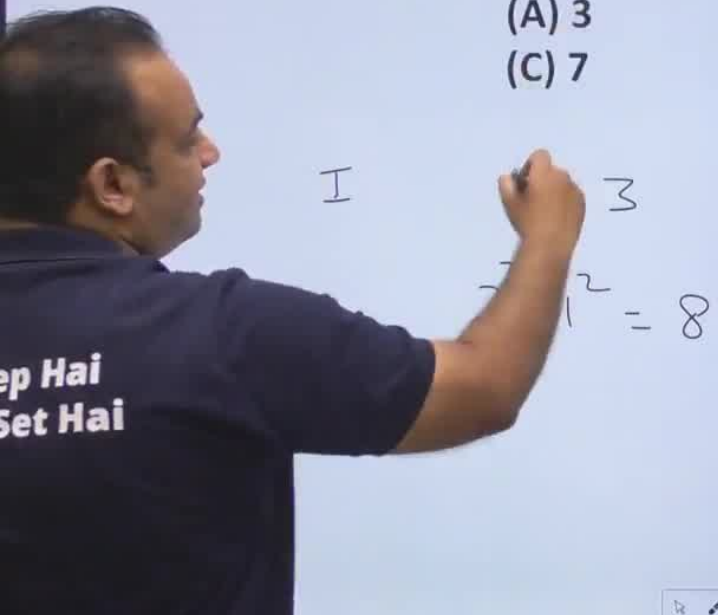
(A) 6
(B) 12
(C) 24
(D) 120

The product of 4 consecutive integers is always divisible by 24

gradeup

5. The difference between the squares of 2 consecutive odd integers is always divisible by ?

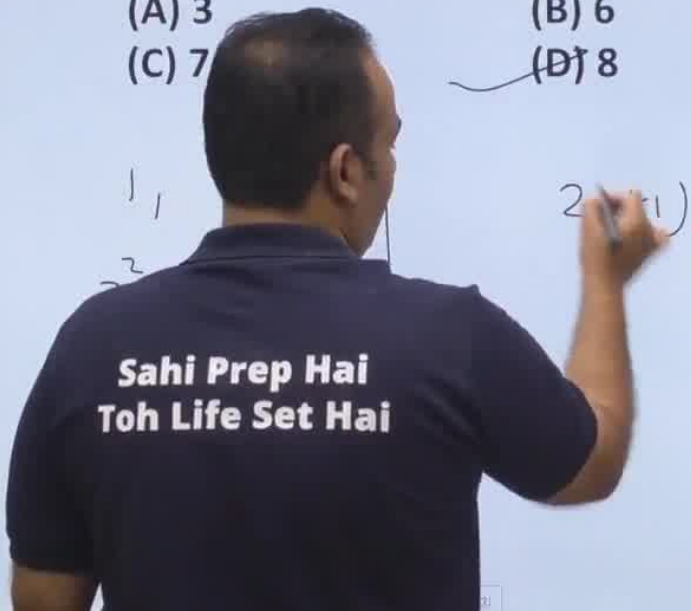
(A) 3
(B) 6
(C) 7
(D) 8



gradeup

5. The difference between the squares of 2 consecutive odd integers is always divisible by ?

(A) 3
(B) 6
(C) 7
(D) 8



gradeup

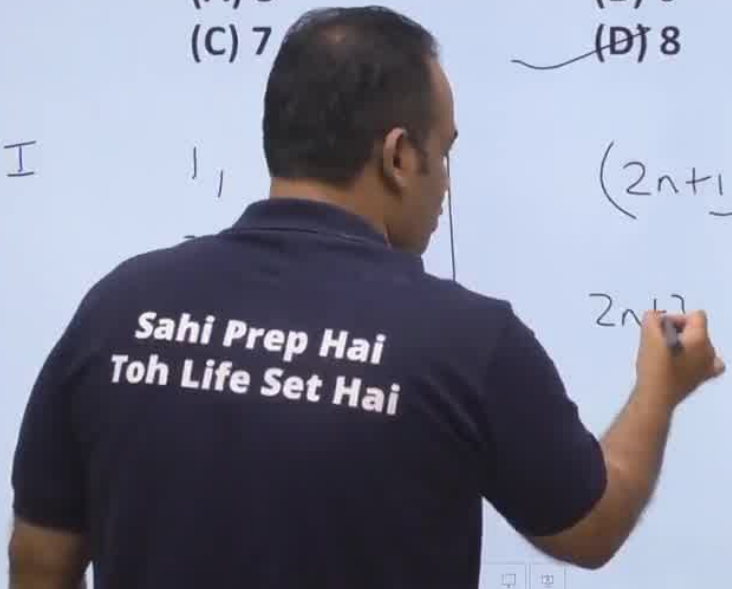
5. The difference between the squares of 2 consecutive odd integers is always divisible by ?

(A) 3
(B) 6
(C) 7
(D) 8

I

$(2n+1), (2n+3)$

$2n+3$



gradeup

5. The difference between the squares of 2 consecutive odd integers is always divisible by ?

(A) 3
(B) 6
(C) 7
(D) 8

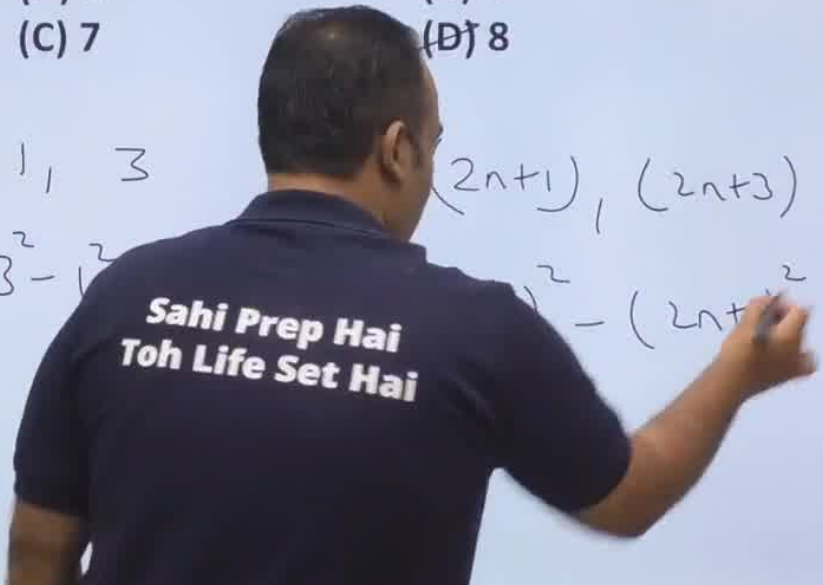
I

1, 3

$3^2 - 1^2$

$(2n+1), (2n+3)$

$(2n+3)^2 - (2n+1)^2$



gradeup

5. The difference between the squares of 2 consecutive odd integers is always divisible by ?

(A) 3
(B) 6
(C) 7

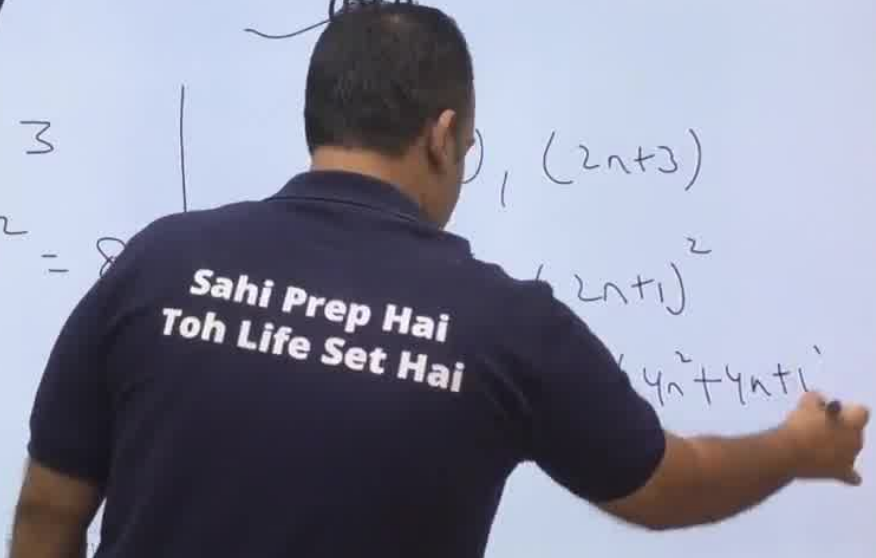
I 1, 3

$3^2 - 1^2 = 8$

$(2n+3)$

$(2n+1)^2$

$4n^2+4n+1$



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5. The difference between the squares of 2 consecutive odd integers is always divisible by ?

(A) 3 (B) 6
(C) 7 (D) 8

$5^2 - 3^2 = 16$

I

1, 3

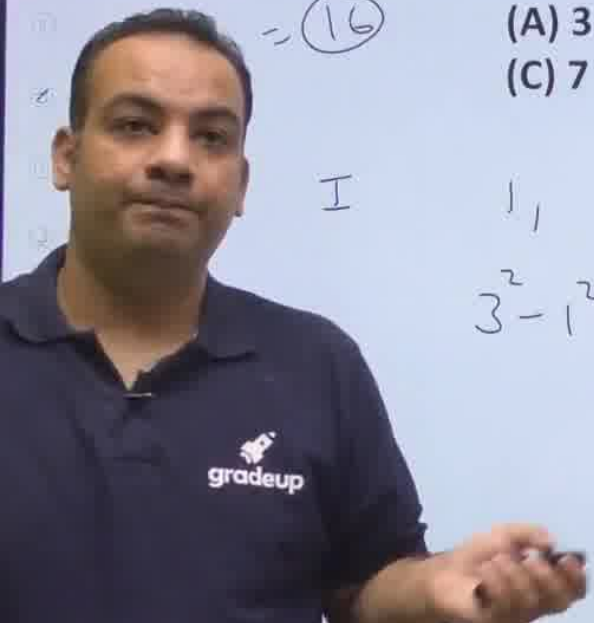
$3^2 - 1^2 = 8$

$(2n+1), (2n+3)$

$(2n+3)^2 - (2n+1)^2$

$(4n^2+12n+9) - (4n^2+4n+1)$

$= 8n+8 \Rightarrow 8(n+1)$



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Ans: (D)

2 consecutive odd integers can be $(2x + 1)$ and $(2x - 1)$

$(2x + 1)^2 - (2x - 1)^2$

$(4x^2 + 4x + 1) - (4x^2 - 4x + 1) = 8x$

So difference between squares of 2 consecutive odd integers is always divisible by 8.

OR

You can eliminate options by putting values

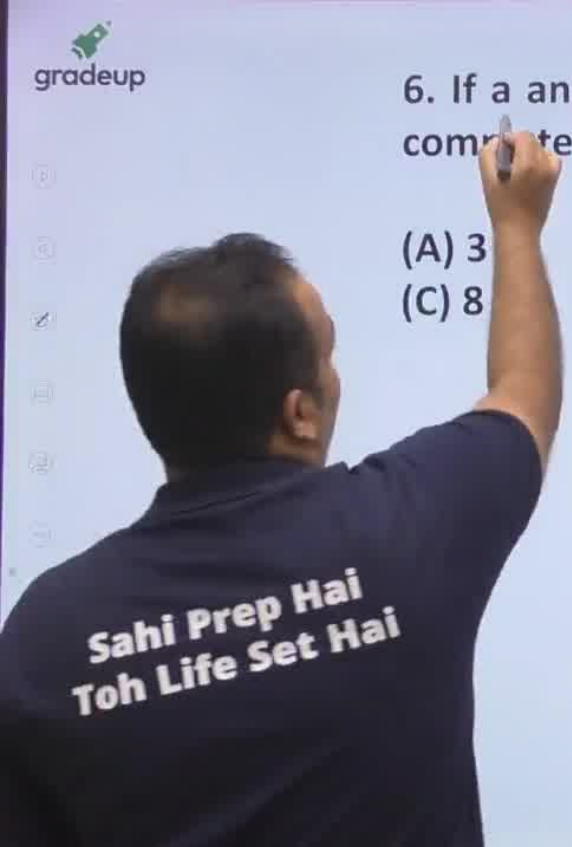
Let, numbers are 3 and 1.

$3^2 - 1^2 = 8$

gradeup

6. If a and b are two positive odd integers, then (a^4-b^4) is comp[illegible]tely divisible by which of the following ?

(A) 3
(B) 6
(C) 8
(D) 12



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Ans: (C)

$a^4 - b^4$

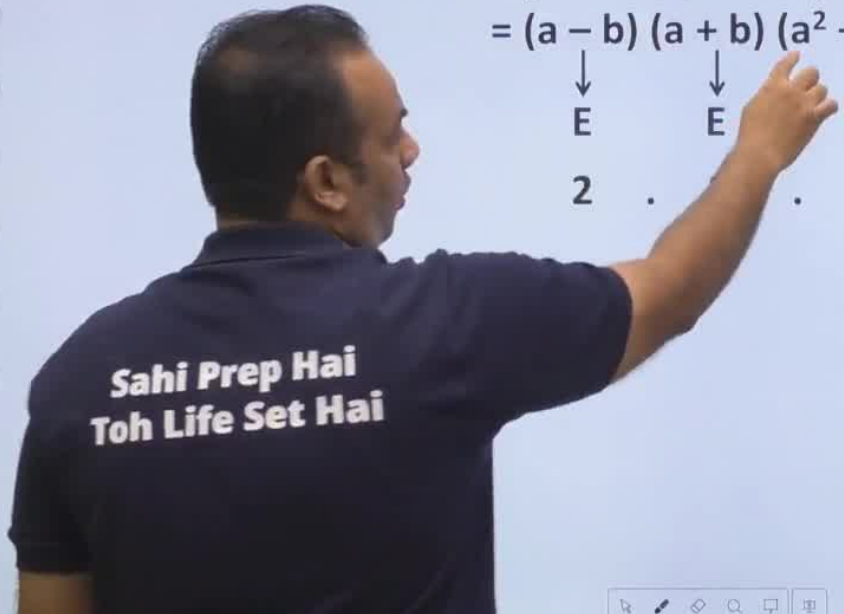
As a and b are odd numbers.

$a^4 - b^4 = (a^2 - b^2)(a^2 + b^2)$

$= (a - b)(a + b)(a^2 + b^2)$

E E E

2 . . 2



Ans: (C)

$a^4 - b^4$

As a and b are odd numbers.

$a^4 - b^4 = (a^2 - b^2)(a^2 + b^2)$

$= (a - b)(a + b)(a^2 + b^2)$

E E E

2 . 2 . 2

$= 8$

gradeup

7. If m and n are positive integers and (m-n) is an even number, then (m^2-n^2) will always be divisible by ?

(A) 4
(B) 6
(C) 8
(D) 12

gradeup

7. If m and n are positive integers and (m-n) is an even number, then (m^2-n^2) will always be divisible by ?

5_1 1

$5^2-1^2=24$

5_1 3 $5^2-3^2=16$

4^2-2^2

$=12$

(A) 4 ✓

(B) 6 ✓

(C) 8 ✓

(D) 12

m − n = even

odd − odd = even

even − even = even

gradeup

7. If m and n are positive integers and (m-n) is an even number, then (m^2-n^2) will always be divisible by ?

5_1 1

$5^2-1^2=24$

5_1 3 $5^2-3^2=16$

4^2-2^2

$=12$

(A) 4 ✓

(B) 6 ✓

(C) 8 ✓

(D) 12 ✓

m − n = even

odd − odd = even

even − even = even

gradeup

Ans: (A)

m and n are +ve integers.

m – n = Even number

It means,

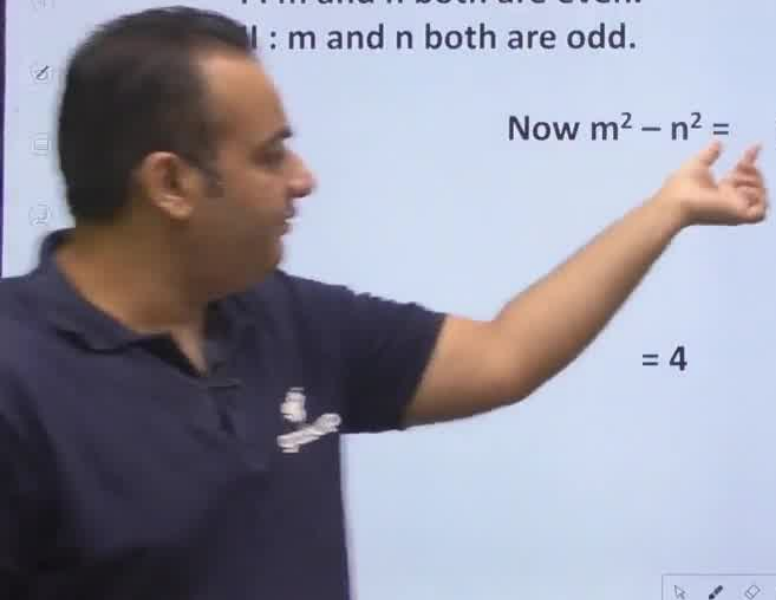
I : m and n both are even.

II : m and n both are odd.

Now $m^2 - n^2 =$ $(m - n)(m + n)$

2 . 2

$= 4$



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Ans: (A)

m and n are +ve integers.

m – n = Even number

It means,

I : m and n both are even.

II : m and n both are odd.

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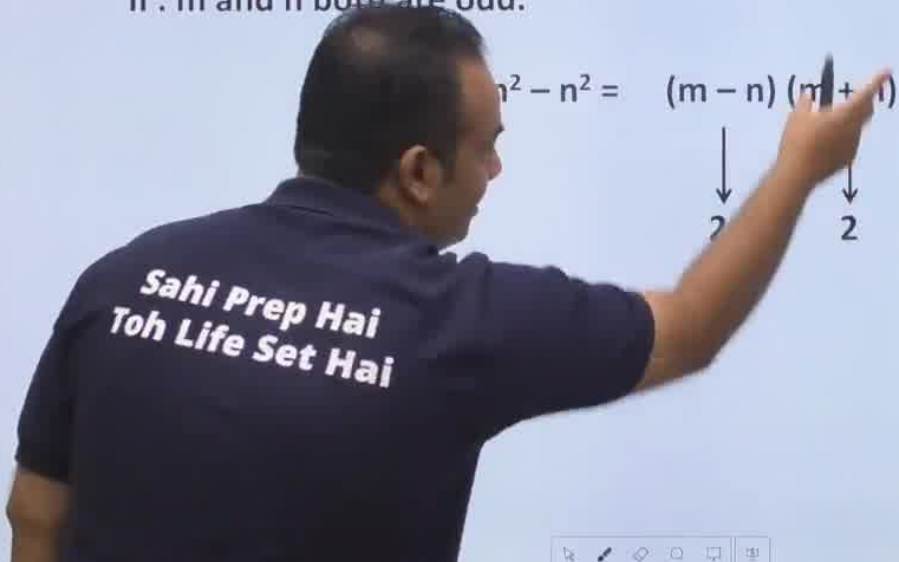
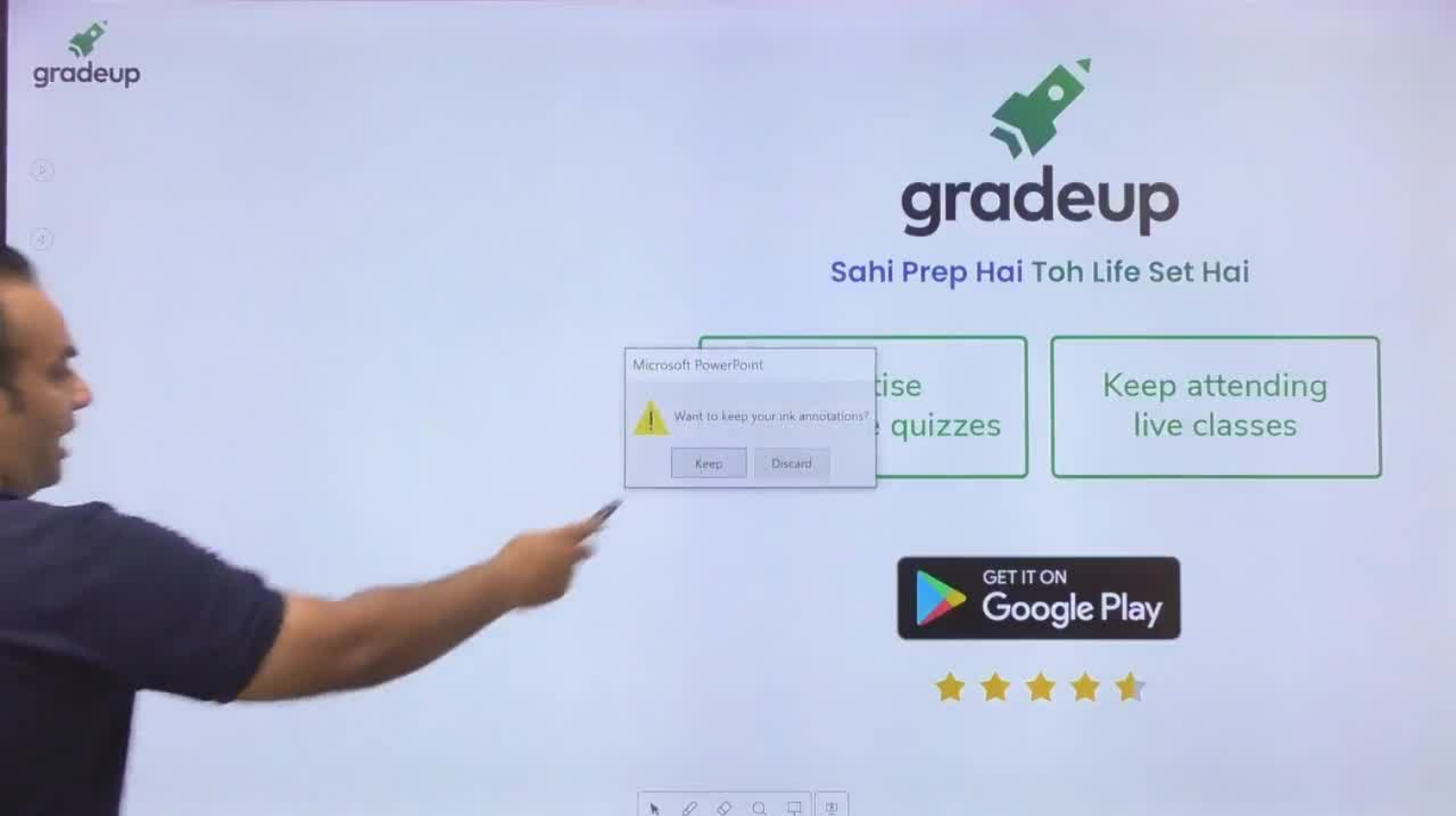
2 2

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Ans: (A)

m and n are +ve integers.

m – n = Even number

It means,

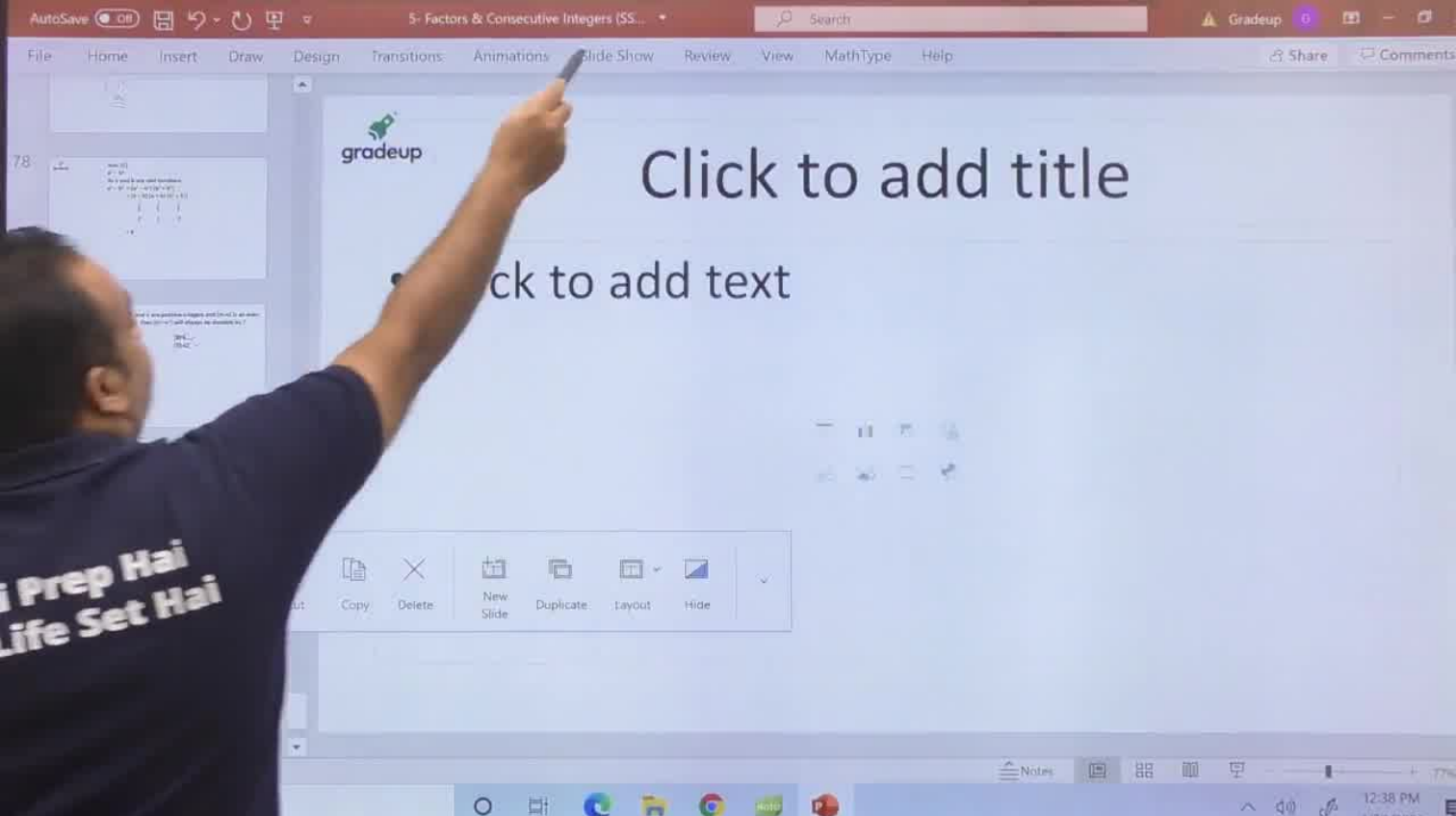
I : m and n both are even.

II : m and n both are odd.

Now $m^2 - n^2 =$ (m – n) (m + n)

2 . 2

= 4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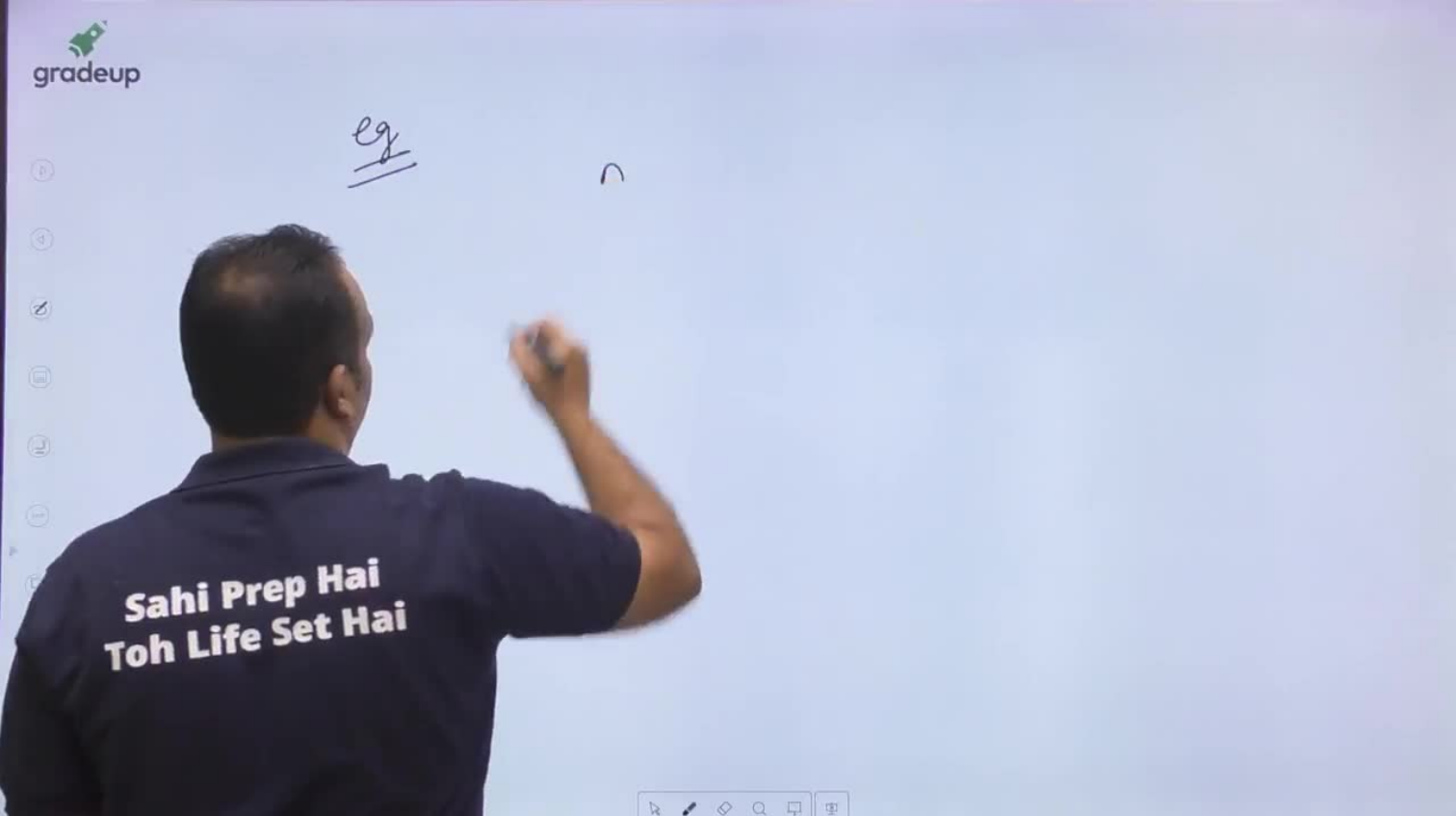
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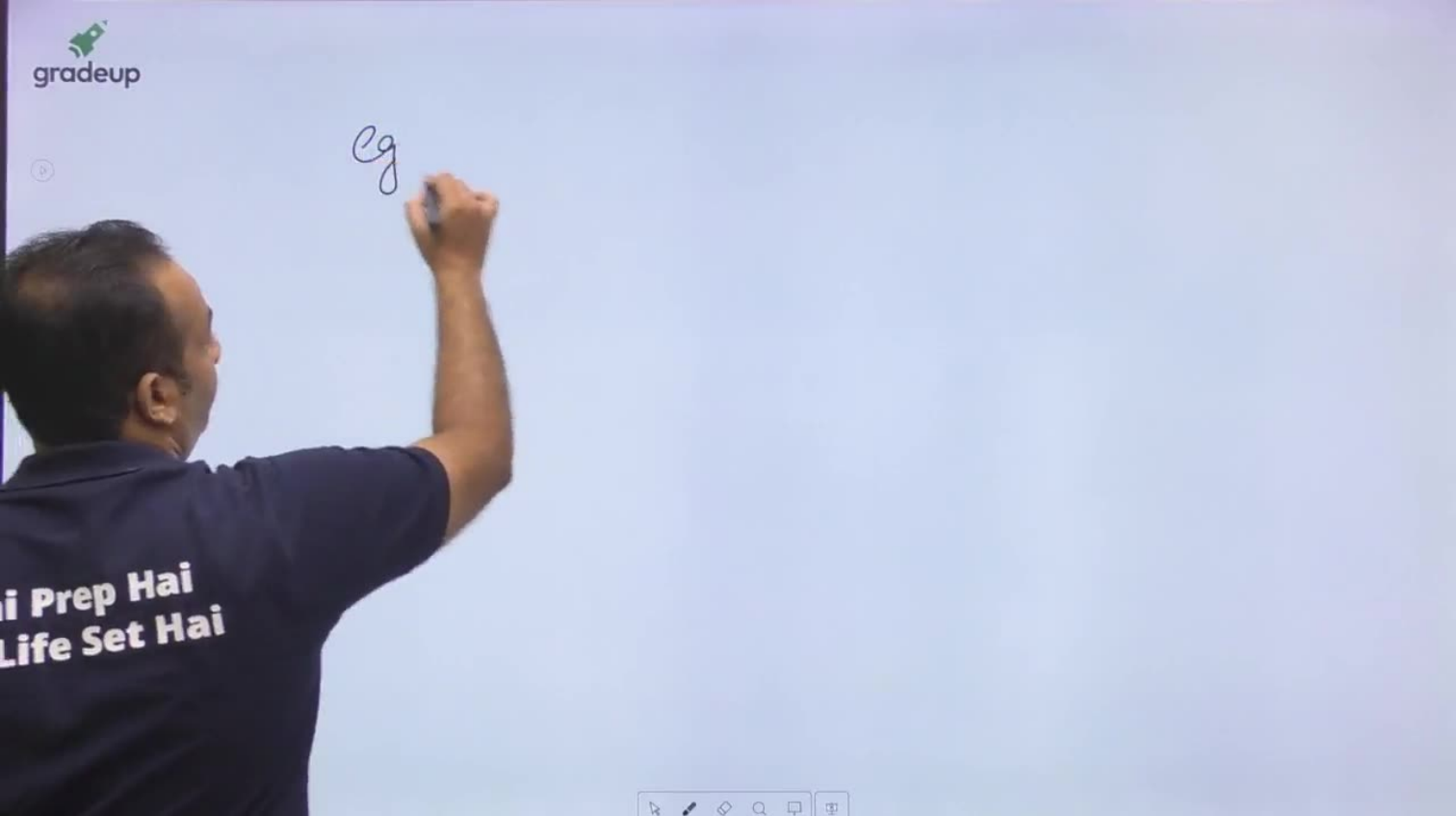
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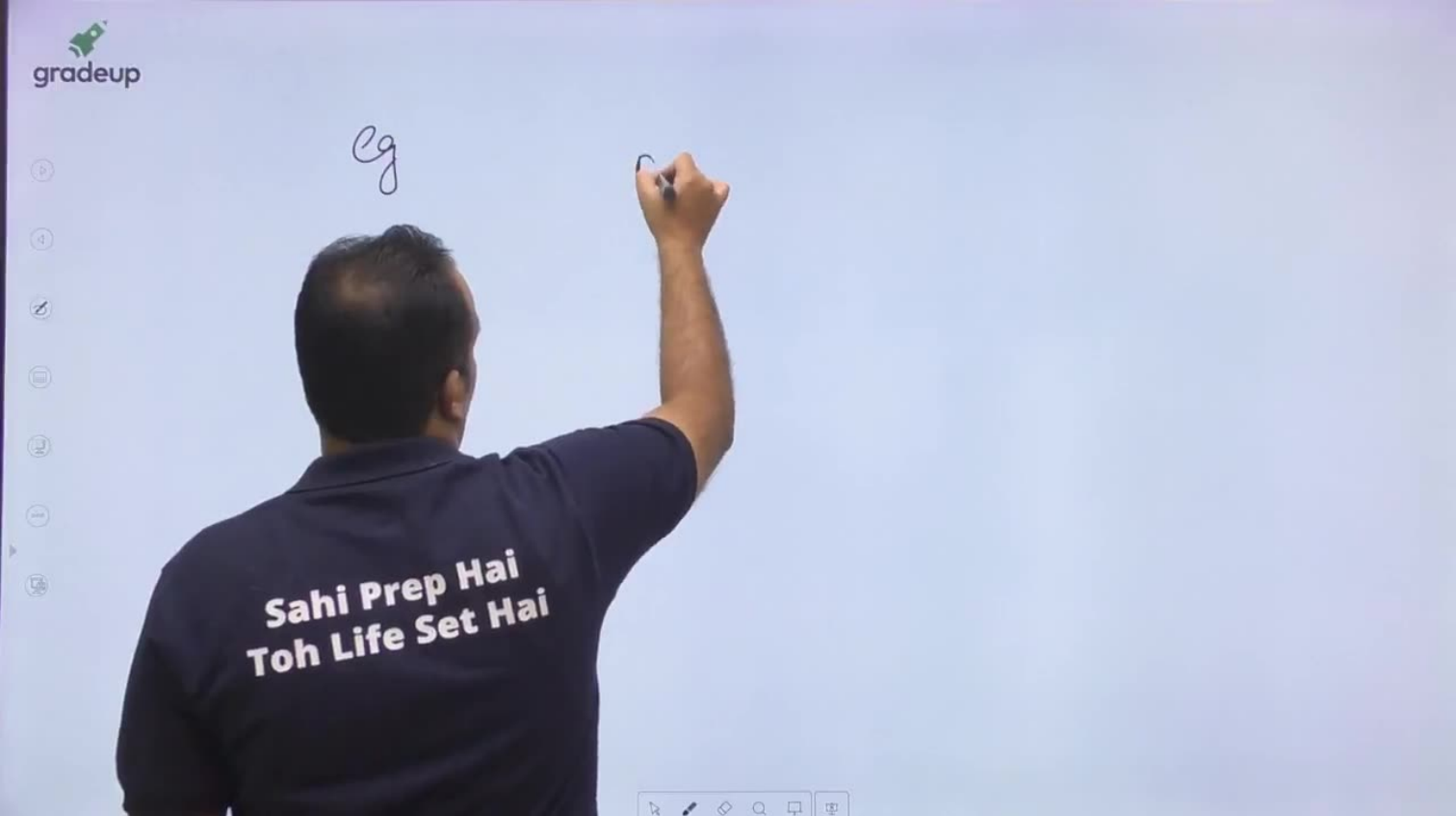
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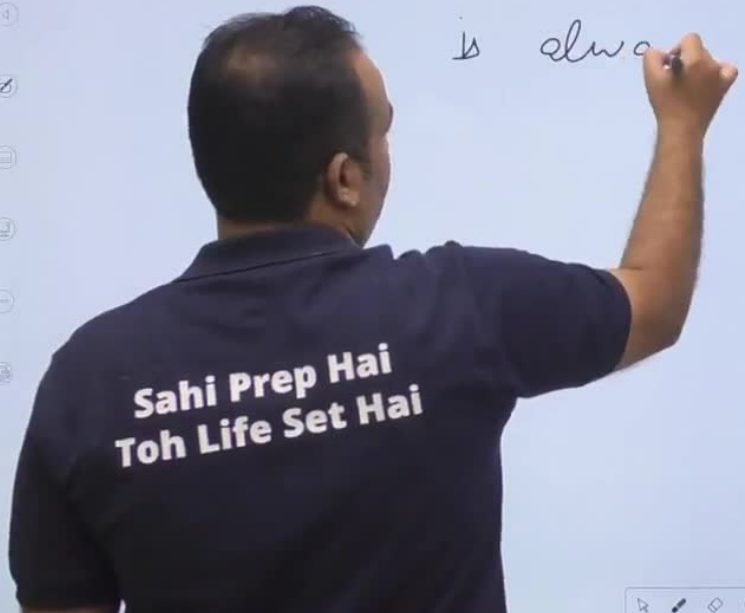
Eg $n(n+1)(n+2)(n+3)+24$

is alwa



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Eg $n(n+1)(n+2)(n+3) + 24$

is always divisible by

(A) 6

(B)

4

(D) 48

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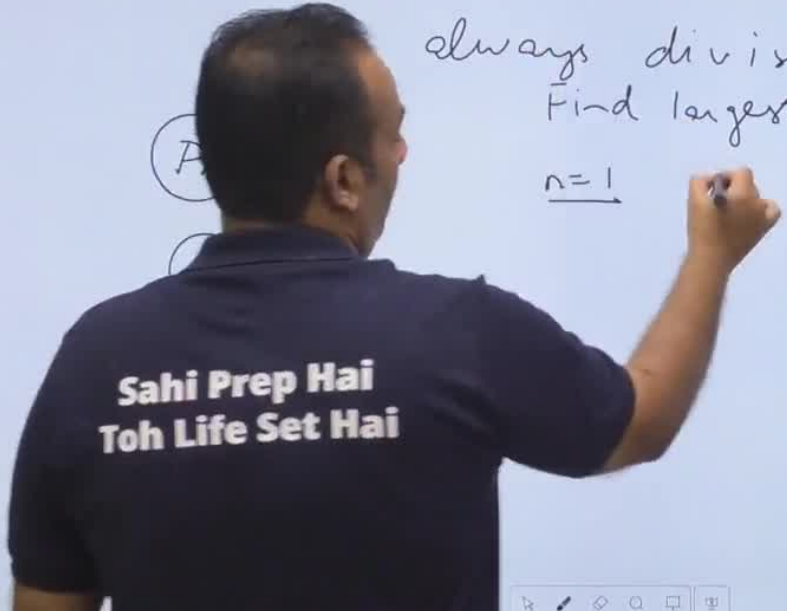
Eg $n(n+1)(n+2)(n+3)+24$

always divisible by K

Find largest value of K

$n=1$



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Eg $n(n+1)(n+2)(n+3)+24$

is always divisible by K

Find largest value of K

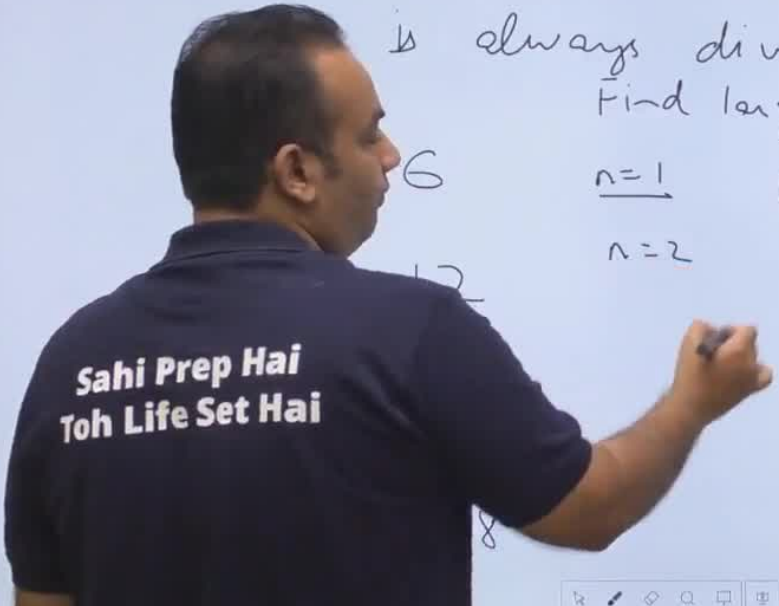
$n=1$ $\quad 1\cdot 2\cdot 3\cdot 4+24=48$

$n=2$

6

12

8



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Eg $n(n+1)(n+2)(n+3) + 24$

always divisible by K

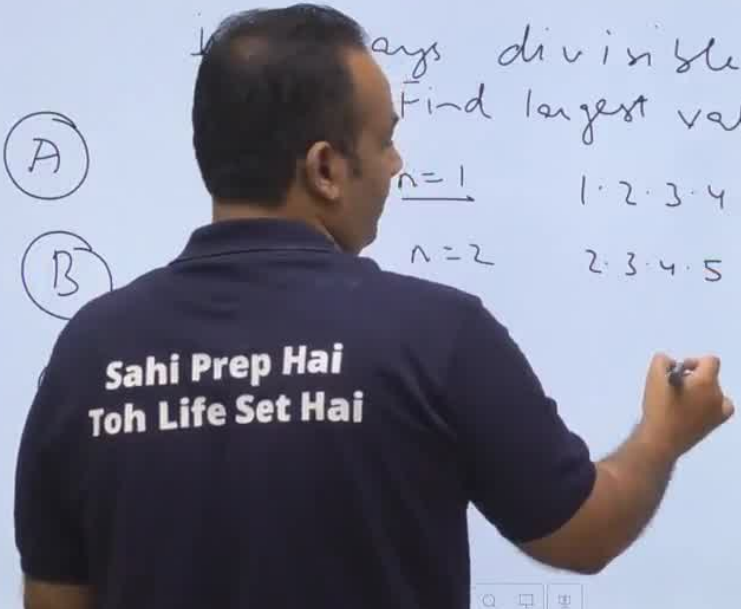
Find largest value of K

A

$n=1$ $\quad 1 \cdot 2 \cdot 3 \cdot 4 + 24 = 48$

B

$n=2$ $\quad 2 \cdot 3 \cdot 4 \cdot 5$



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Eg $n(n+1)(n+2)(n+3)+24$

is always divisible by K

Find largest value of K

6

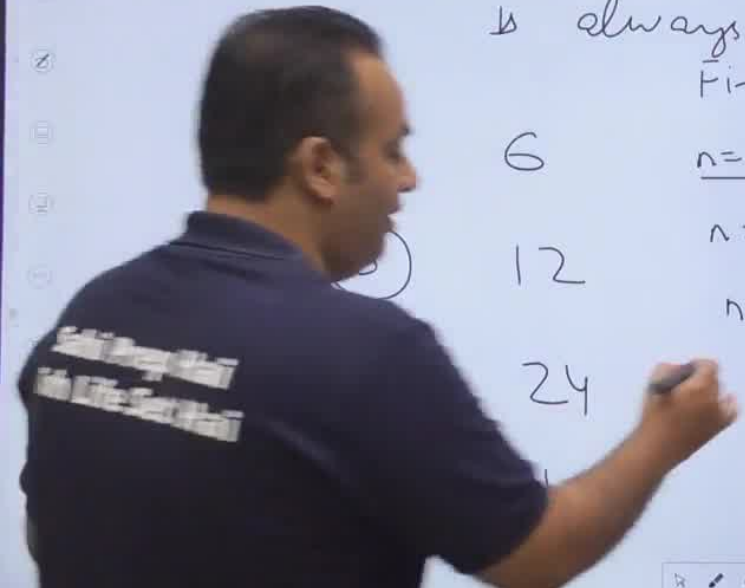
$n=1$ $1\cdot2\cdot3\cdot4+24=48$

12

$n=2$ $2\cdot3\cdot4\cdot5+24=144$

$n=3$ $3\cdot4\cdot5\cdot6+24=384$

24



gradeup

Eg $n(n+1)(n+2)(n+3) + 24$

always divisible by K

Find largest value of K

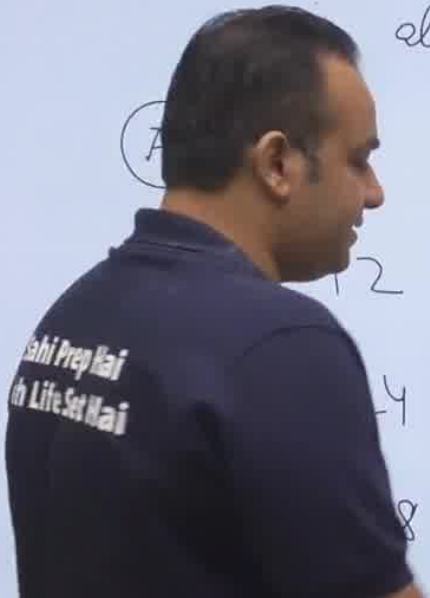
$n=1$ $1 \cdot 2 \cdot 3 \cdot 4 + 24 = 48$

$n=2$ $2 \cdot 3 \cdot 4 \cdot 5 + 24 = 144$

$n=3$ $3 \cdot 4 \cdot 5 \cdot 6 + 24 = 384$

$n=4$ $4 \cdot 5 \cdot 6 \cdot 7 + 24 = 864$

$n=5$ $5 \cdot 6 \cdot 7 \cdot 8$



gradeup

eg $n(n+1)(n+2)(n+3)+24$

always divisible by K

Find largest value of K

A

$n=1$ $1\cdot2\cdot3\cdot4+24 = 48$

D

$n=2$ $2\cdot3\cdot4\cdot5+24 = 144$

$n=3$ $3\cdot4\cdot5\cdot6+24 = 384$

$=4$ $4\cdot5\cdot6\cdot7+24 = 864$

$5\cdot6\cdot7\cdot8$

Sahi Prep Hai
Toh Life Set Hai

gradeup

Eg $n(n+1)(n+2)(n+3) + 24$

is always divisible by K

Find largest value of K

(A) 6

(B) 12

(C) 24

(D) 48

$n=1$ $1 \cdot 2 \cdot 3 \cdot 4 + 24 = 48$

$n=2$ $2 \cdot 3 \cdot 4 \cdot 5 + 24 = 144$

$n=3$ $3 \cdot 4 \cdot 5 \cdot 6 + 24 = 384$

$n=4$ $4 \cdot 5 \cdot 6 \cdot 7 + 24 = 864$

$n=5$ $5 \cdot 6 \cdot 7 \cdot 8 + 24 = 1704$

gradeup

24

eg $n(n+1)(n+2)(n+3) + 24$

always divisible by K

Find largest value of K

6 $n=1$ $1 \cdot 2 \cdot 3 \cdot 4 + 24 = 48$

$n=2$ $2 \cdot 3 \cdot 4 \cdot 5 + 24 = 144$

$n=3$ $3 \cdot 4 \cdot 5 \cdot 6 + 24 = 384$

24 $n=4$ $4 \cdot 5 \cdot 6 \cdot 7 + 24 = 864$

48 $n=5$ $5 \cdot 6 \cdot 7 \cdot 8 + 24 = 1704$

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$24x + 24$

eg $n(n+1)(n+2)(n+3) + 24$

is ways divisible by K

Find largest value of K

$n=1$ $1 \cdot 2 \cdot 3 \cdot 4 + 24 = 48$

$n=2$ $2 \cdot 3 \cdot 4 \cdot 5 + 24 = 144$

$n=3$ $3 \cdot 4 \cdot 5 \cdot 6 + 24 = 384$

$n=4$ $4 \cdot 5 \cdot 6 \cdot 7 + 24 = 864$

$n=5$ $5 \cdot 6 \cdot 7 \cdot 8 + 24 = 1704$

24

48

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$24x + 24 = 24(x+1)$

Eg $n(n+1)(n+2)(n+3) + 24$

is always divisible by K

Find largest value of K

6

12

$n=1$ $1 \cdot 2 \cdot 3 \cdot 4 + 24 = 48$

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gradeup

$24x + 24 = 24(x+1)$

Eg $n(n+1)(n+2)(n+3) + 24$

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