

NUMBER SYSTEM

FACTORS

गुणनखंड

CLASS NOTES

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Factor (गुणखंड)

12 → 1, 2, 3, 4, 6, 12

Factor \leq Number

- ✓ No. of factors
- ✓ " " even factors
- ✓ " " odd "
- ✓ Sum of factors.
- ✓ Sum of even factors.
- ✓ " " odd "
- ✓ Product of factors.
- ✓ Misc.

Multiple (गुणांक)

12 → 12, 24, 36, 48, ... ∞

Multiple \geq Number

⊙ Type-1 (No. of factors)

$$24 = 2^3 \times 3^1$$

$$\text{N.O.F} = (3+1) \times (1+1)$$

$$= 4 \times 2$$

$$= \underline{\underline{8}}$$

$$\begin{array}{r} 2 \\ 2 \\ 2 \\ 3 \end{array} \left| \begin{array}{l} 24 \\ 12 \\ 6 \\ 3 \end{array} \right. \begin{array}{l} \\ \\ \\ - \end{array}$$

Q. N.O.F of 30 = ?

Solⁿ

$$30 = 2 \times 3 \times 5$$

$$\text{N.O.F} = 2 \times 2 \times 2 = \underline{\underline{8}}$$

Q. N.O.F = 2700 ?

Ans $2700 = 2^2 \times 3^3 \times 5^2$

$$\text{N.O.F} = 3 \times 4 \times 3 = \underline{\underline{36}}$$

$$2700 = \underline{\underline{27}} \times 100$$

$$3^3 \times 2^2 \times 5^2$$

$$10 = 2 \times 5$$

$$100 = 2^2 \times 5^2$$

$$1000 = 2^3 \times 5^3$$

Q. N.O.F of 1800 ?

Ans $1800 = 18 \times 100$
 $= 3^2 \times 2^1 \times 2^2 \times 5^2$
 $= 2^3 \times 3^2 \times 5^2$

N.O.F = $4 \times 3 \times 3$
 $= \underline{\underline{36}}$

1000 का 5.7 प्रतिशत

$$\frac{999}{5} = 199$$

35

$$\frac{999}{7} = 142$$

$$\frac{999}{35} = \textcircled{28}$$

341

~~25~~
 $\textcircled{56}$

1. Find the total number of factor of 1470.

1470 के कुल गुणखण्डों की संख्या ज्ञात करें।

(a) 20

(b) 18

(c) 24

(d) 22

$$\begin{aligned} 1470 &= 147 \times 10 \\ &= 7 \times 21 \times 10 \\ &= 7 \times 7 \times 3 \times 2 \times 5 \\ &= 2^1 \times 3^1 \times 5^1 \times 7^2 \end{aligned}$$

$$\begin{aligned} \text{N.O.F} &= 2 \times 2 \times 2 \times 3 \\ &= 24 \end{aligned}$$

$$\begin{aligned} 3600 &= 36 \times 100 \\ &= 9 \times 4 \times 2^2 \times 5^2 \\ &= 3^2 \times 2^2 \times 2^2 \times 5^2 \\ &= 2^4 \times 3^2 \times 5^2 \\ \text{N.O.F} &= 5 \times 3 \times 3 \\ &= \underline{\underline{45}} \end{aligned}$$

2. Find the total number of factor of 3600.

3600 के कुल गुणखण्डों की संख्या ज्ञात करें।

SSC CGL TIER-II 12 / 09 / 2019

- (a) 45
- (b) 44
- (c) 43
- (d) 42

3. Find the proper factors of 2940.

2940 का समुचित गुणखंडों की संख्या ज्ञात करें।

(a) 34

(b) 36

(c) 24

(d) 32

$$2940 = 2^2 \times 3^1 \times 5^1 \times 7^2$$

$$\text{No. of factors} = 3 \times 2 \times 2 \times 3 = \underline{\underline{36}}$$

$$\begin{aligned} \text{Proper factors} &= 36 - 1 - 1 \\ &= \underline{\underline{34}} \end{aligned}$$

36 → ~~1, 2, 3, 4, 9, 12, 18, 36~~

N.O.F = 9

Proper factors = 7

Q. Find proper factors of 42.

Ans $42 = 2 \times 3 \times 7$

$$N.O.F = 2 \times 2 \times 2$$

$$= 8$$

$$\text{proper factor} = 8 - 1 - 1$$
$$= \underline{\underline{6}}$$

$$\begin{aligned}
 N &= 4^1 + 4^2 + 4^3 + 4^4 \\
 &= 4^1(4^0 + 4^1 + 4^2 + 4^3) \\
 &= 4^1(1 + 4 + 16 + 64)
 \end{aligned}$$

$$\begin{aligned}
 N &= 4^1 \times 85 \\
 &= (2^2)^1 \times 5^1 \times 17^1 \\
 &= 2^{2 \times 1} \times 5^1 \times 17^1
 \end{aligned}$$

$$\begin{aligned}
 \text{No. of factors} &= 2 \times 3 \times 2 \\
 &= \underline{\underline{12}}
 \end{aligned}$$

4. If $N = 4^{11} + 4^{12} + 4^{13} + 4^{14}$ then how many positive factors of N are there?

यदि $N = 4^{11} + 4^{12} + 4^{13} + 4^{14}$

तो N के कुल कितने धनात्मक गुणखंड होंगे?

- (a) 92
- (b) 48
- (c) 50
- (d) 51

$$\begin{aligned}
 10^0 &= 1 \\
 9^0 &= 1 \\
 91^0 &= 1
 \end{aligned}$$

$$\textcircled{Q}. N = 4^6 + 4^7 + 4^8 + 4^9$$

$$N.O.F = ?$$

Ans $N = 4^6(4^0 + 4^1 + 4^2 + 4^3)$
 $= 4^6(1 + 4 + 16 + 64)$

$$N = 4^6 \times 85$$

$$\therefore N = (2^2)^6 \times 5 \times 17$$
$$= 2^{12} \times 5^1 \times 17^1$$

$$N.O.F = 13 \times 2 \times 2$$

$$= \underline{\underline{52}}$$

$$* 85 = 1' \times \underline{\underline{85}}$$

$$\begin{aligned} \text{N.O.F} &= 2 \times 2 \\ &= 4 \checkmark \end{aligned}$$

$$* 85 = 5' \times 17'$$

$$\text{N.O.F} = 2 \times 2 = 4 \checkmark$$

$$\text{Q } 36 = 1' \times 36'$$

$$\begin{aligned} \text{N.O.F} &= 2 \times 2 \\ &= 4 \end{aligned}$$

$$36 = 2' \times 18'$$

$$\begin{aligned} \text{N.O.F} &= 2 \times 2 \\ &= 4 \end{aligned}$$

$$36 = 6' \times 6'$$

$$\begin{aligned} \text{N.O.F} &= 2 \times 2 \\ &= 4 \end{aligned}$$

$$36 = 2^2 \times 3^2$$

$$\begin{aligned} \text{N.O.F} &= 3 \times 3 \\ &= 9 \end{aligned}$$

$$\begin{aligned} N &= 4^4 + 6^6 \\ &= (2^2)^4 + (2 \times 3)^6 \\ &= 2^8 + 2^6 \times 3^6 \\ &= 2^6 (2^2 + 2^0 \times 3^6) \\ &= 2^6 (4 + 1 \times 729) \end{aligned}$$

$$N = 2^6 \times 733$$

$$N.O.F = 7 \times 2 = 14$$

5. If $N = 4^4 + 6^6$, then find the number of factors of N.

यदि $N = 4^4 + 6^6$ है, तो N के गुणखंडों की संख्या ज्ञात करें।

- (a) 28
- (b) 56
- (c) 14
- (d) 7

Q. $N = 2^4 \times 3^2 \times 5^3$
Total no. of factors = ?

Solⁿ

$$\text{ans} = 5 \times 3 \times 4 \\ = 60$$

Q. $N = 2^4 \times 3^2 \times 5^3$
even factors = ?

$$\text{ans} = 4 \times 3 \times 4 \\ = \underline{\underline{48}}$$

Q. $N = \cancel{2^4} \times 3^2 \times 5^3$
odd factors = ?

$$\text{ans} = 3 \times 4 \\ = \underline{\underline{12}}$$

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

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

~~$1 = 2^0$~~
 2^1
 2^2
 2^3

$3^0 = 1$
 3^1
 3^2

Total no. of factors = $4 \times 3 = 12$
even factors = 3×3
odd factors = 3

6. Find the number of odd factors of 7200.

7200 के विषम गुणखंडों की संख्या ज्ञात करें।

(a) 4

(b) 9

(c) 54

(d) 45

$$7200 = 2^5 \times 3^2 \times 5^2$$

$$\text{Total} = 6 \times 3 \times 3 = 54$$

$$\text{even} = 5 \times 3 \times 3 = 45$$

$$\text{odd} = 3 \times 3 = 9$$

7. Find the number of even factors of 10500.

10500 के सम गुणखंडों की संख्या ज्ञात करें।

(a) 48

(b) 16

(c) 32

(d) 46

$$10500 = 2^2 \times 3^1 \times 5^3 \times 7^1$$

$$\text{Total} = 3 \times 2 \times 4 \times 2 = 48$$

$$\text{even} = 2 \times 2 \times 4 \times 2 = 32$$

$$\text{odd} = 2 \times 4 \times 2 = \underline{\underline{16}}$$

$$\textcircled{1}. N = 2^4 \times 3^2 \times 5^2$$

- Total = $5 \times 3 \times 3 = 45$

- Even = $4 \times 3 \times 3 = 36$

- Odd = $3 \times 3 = 9$

Sum of factors

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

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

- Sum of all factors = $1 + 2 + 3 + 4 + 6 + \dots + 72 = 195$
- " " even factors = $2 + 4 + 6 + 8 + 12 + 18 + 24 + 36 + 72 = 182$
- " " Odd " = $1 + 3 + 9 = 13$

Sum of factors

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

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

Total

$$\begin{aligned} & (2^0 + 2^1 + 2^2 + 2^3) \times (3^0 + 3^1 + 3^2) \\ &= (1 + 2 + 4 + 8) \times (1 + 3 + 9) \\ &= 15 \times 13 \\ &= 195 \end{aligned}$$

Even

$$\begin{aligned} &= (2^1 + 2^2 + 2^3) \times (3^0 + 3^1 + 3^2) \\ &= (2 + 4 + 8) \times (1 + 3 + 9) \\ &= 14 \times 13 \\ &= 182 \end{aligned}$$

odd

$$\begin{aligned} &= (3^0 + 3^1 + 3^2) \\ &= (1 + 3 + 9) \\ &= 13 \end{aligned}$$

8. The sum of all factors of 19600 is :

19600 के सभी गुणखंडों का योगफल ज्ञात करें।

(a) 5428

(b) 54777

(c) 33667

(d) None of these

$$19600 = 2^4 \times 5^2 \times 7^2$$

$$\begin{aligned} \text{Sum} &= (2^0 + 2^1 + 2^2 + 2^3 + 2^4) \times (5^0 + 5^1 + 5^2) \times (7^0 + 7^1 + 7^2) \\ &= (1 + 2 + 4 + 8 + 16) \times (1 + 5 + 25) \times (1 + 7 + 49) \end{aligned}$$

$$= 31 \times 31 \times 54$$

$$= 961 \times 54$$

$$= 54777$$

$$\text{Q. } N = 2^2 \times 3^2 \times 5^2$$

Total (Sum)

$$\text{ans} = (2^0 + 2^1 + 2^2) \times (3^0 + 3^1 + 3^2) \\ \times (5^0 + 5^1 + 5^2)$$

$$= (1 + 2 + 4) \times (1 + 3 + 9) \\ \times (1 + 5 + 25)$$

$$= 7 \times 13 \times 31$$

$$= 91 \times 31$$

$$= \underline{2821}$$

Even (Sum)

$$\text{ans} = (2^1 + 2^2) \times (3^0 + 3^1 + 3^2) \\ \times (5^0 + 5^1 + 5^2)$$

$$= (2 + 4) \times (1 + 3 + 9) \times (1 + 5 + 25)$$

$$= 6 \times 13 \times 31$$

$$= 78 \times 31$$

$$= \underline{2418}$$

odd (Sum)

$$= (3^0 + 3^1 + 3^2) \times (5^0 + 5^1 + 5^2) \\ = (1 + 3 + 9) \times (1 + 5 + 25)$$

$$= 13 \times 31$$

$$= \underline{403}$$

9. The sum of odd divisors of 158760 is :

158760 के विषम गुणखंडों का योगफल ज्ञात करें।

(a) 41211

(b) 618165

(c) 576945

(d) None of these

$$158760 = 2^3 \times 3^4 \times 5^1 \times 7^2$$

$$\text{ans} = (3^0 + 3^1 + 3^2 + 3^3 + 3^4) \times (5^0 + 5^1) \times (7^0 + 7^1 + 7^2)$$

$$= (1 + 3 + 9 + 27 + 81) \times (1 + 5) \times (1 + 7 + 49)$$

$$= 121 \times 6 \times 54$$

$$= 726 \times 54$$

$$= 41382$$

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

$$N.O.F = 4 \times 3 \times 2 = 24$$

$$S.O.F = (2^0 + 2^1 + 2^2 + 2^3) \times (3^0 + 3^1 + 3^2) \times (5^0 + 5^1)$$

$$= (1 + 2 + 4 + 8) \times (1 + 3 + 9) \times (1 + 5)$$

$$= 15 \times 13 \times 6$$

$$= \underline{1170}$$

10. Consider the following statements in respect of all factors of 360:

360 के सभी गुणखंडों के संदर्भ में निम्नलिखित कथनों पर विचार कीजिए:

1. The number of factors is 24.

गुणखंडों की संख्या 24 है।

2. The sum of all factors is 1170.

सभी गुणखंडों का योगफल 1170 है।

[CDS - 2023 (I)]

Which of the above statements is/are correct?

उपरोक्त में से कौन सा/से कथन सही है/हैं?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

11. The sum of even divisors of 4096 is :

4096 के सम गुणखंडों का योगफल ज्ञात करें।

- (a) 6144
- (b) 8190
- (c) 8192
- (d) 6142

$$4096 = 2^{12}$$

$$\begin{aligned}
 \text{Ans} &= (2^1 + 2^2 + 2^3 + \dots + 2^{12}) \\
 &= (2 + 4 + 8 + \dots + 4096) \\
 &= \frac{2 \times (2^{12} - 1)}{(2 - 1)} = \frac{2 \times 4096}{1} = 8192
 \end{aligned}$$

$$S_n = \frac{a(r^n - 1)}{(r - 1)}$$

12.
H.W.

The sum of even factors of 1800 is :

1800 के सम गुणखंडों का योगफल ज्ञात करें।

(a) 403

(b) 6045

(c) 6448

(d) 5642

$$\begin{aligned}
 N &= 12^6 \times 3^8 \times 5^3 \\
 &= (2^2 \times 3)^6 \times 3^8 \times 5^3 \\
 &= 2^{12} \times 3^6 \times 3^8 \times 5^3 \\
 &= 2^{12} \times 3^{14} \times 5^3
 \end{aligned}$$

$$\begin{aligned}
 \text{even N.O.F} &= 12 \times 15 \times 4 \\
 &= \underline{720}
 \end{aligned}$$

$$\text{Odd N.O.F} = 15 \times 4 = \underline{60}$$

13. Consider the number $N = 12^6 \times 3^8 \times 5^3$.
 संख्या $N = 12^6 \times 3^8 \times 5^3$ पर विचार करें।
 Which of the following statements is/are correct?

निम्नलिखित में से कौन सा/से कथन सही है/हैं?

1. The number of odd factors of N is 60.
 N के विषम गुणखण्डों की संख्या 60 है।
2. The number of even factors of N is 720.
 N के सम गुणखंडों की संख्या 720 है।

Select the correct answer using the code given below :

नीचे दिए गए कोड का उपयोग करके सही उत्तर चुनें:

[CDS - 2022 (II)]

- | | |
|------------------|---------------------|
| (a) Only 1 | (b) Only 2 |
| (c) Both 1 and 2 | (d) Neither 1 nor 2 |

Q. What is the sum of reciprocal of all factors of number 60.

संख्या 60 के सभी गुणखंड के व्युत्क्रमों का योग क्या है?

60 → 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60

ans = 1/1 + 1/2 + 1/3 + 1/4 + 1/5 + 1/6 + 1/10 + 1/12 + 1/15 + 1/20 + 1/30 + 1/60

= 60 + 30 + 20 + 15 + 12 + 10 + 6 + 5 + 4 + 3 + 2 + 1

Sum of reciprocal of all factors = Sum of all factors / Number.

14. What is the sum of reciprocal of all factors of number 360.

संख्या 360 के सभी गुणखंड के व्युत्क्रमों का योग क्या है?

- (a) 2.65
- (b) 3.25
- (c) 3.48
- (d) 4.20

$$\text{Ans} = \frac{\text{Sum of all factors}}{\text{Number}}$$

$$= \frac{\cancel{1170}}{\cancel{360}} \times \frac{13}{4}$$

$$= 3.25$$

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

$$\text{Sum} = (2^0 + 2^1 + 2^2 + 2^3)(3^0 + 3^1 + 3^2)(5^0 + 5^1)$$

$$= (1 + 2 + 4 + 8)(1 + 3 + 9)(1 + 5)$$

$$= 15 \times 13 \times 6$$

$$= \underline{1170}$$

Product of factors

$$12 \rightarrow \begin{array}{l} 1, 12 \\ 2, 6 \\ 3, 4 \end{array}$$

$$\begin{aligned} \text{P.O.F} &= 1 \times 2 \times 3 \times 4 \times 6 \times 12 \\ &= 12 \times 12 \times 12 \\ &= 12^3 \end{aligned}$$

Trick

$$\text{N.O.F} = 6$$

$$\begin{aligned} \text{P.O.F} &= (12)^{\frac{\text{N.O.F}}{2}} \\ &= 12^{\frac{6}{2}} = 12^3 \end{aligned}$$

15. Find the product of all factors of 544?

544 के सभी गुणखंडों का गुणफल ज्ञात करें।

(a) 12

(b) $544^{\frac{3}{2}}$

(c) 558

(d) 544^6

$$544 = 2^5 \times 17^1$$

$$N.O.F = 6 \times 2 = 12$$

$$P.O.F = (544)^{\frac{12}{2}} = (544)^6$$

16. Find the product of all factors of 1800?

1800 के सभी गुणखंडों का गुणफल ज्ञात करें।

- (a) 1800^{18}
- (b) 1800^8
- (c) 900^{18}
- (d) 900^8

$$1800 = 2^3 \times 3^2 \times 5^2$$

$$N.O.F = 4 \times 3 \times 3 = 36$$

$$Ans = P.O.F = (1800)^{\frac{36}{2}} = (1800)^{18}$$

17. If $847 \times 385 \times 675 \times 3025 = 3^a \times 5^b \times 7^c \times 11^d$,
 then the value of $ab - cd$ is:

यदि $847 \times 385 \times 675 \times 3025 = 3^a \times 5^b \times 7^c \times 11^d$ तो $ab - cd$ का मान क्या होगा:

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- (a) 4
- (b) 5
- (c) 1
- (d) 7

$$\begin{aligned}
 &= \underbrace{7 \times 11 \times 11}_{7 \times 11^2} \times \underbrace{5 \times 7 \times 11}_{5 \times 7 \times 11} \times \underbrace{5^2 \times 3^3}_{5^2 \times 3^3} \times \underbrace{5^2 \times 11^2}_{5^2 \times 11^2} \\
 &= 3^a \times 5^b \times 7^c \times 11^d \\
 &= ab - cd \\
 &= 3 \times 5 - 2 \times 5 \\
 &= 15 - 10 \\
 &= 5
 \end{aligned}$$

18. Find the number of prime factors in the product $(30)^5 \times (24)^5$.

$(30)^5 \times (24)^5$ के अभाज्य गुणखंडों की संख्या ज्ञात करें।

SSC CGL TIER-II (18/11/2020)

- (a) 45
- (c) 10

- (b) 35
- (d) 30

$$\begin{aligned} &= 30^5 \times 24^5 \\ &= (2 \times 3 \times 5)^5 \times (2^3 \times 3)^5 \\ &= 2^5 \times 3^5 \times 5^5 \times 2^{15} \times 3^5 \\ &= 2^{20} \times 3^{10} \times 5^5 \end{aligned}$$

$$\begin{aligned} \text{Ans} &= 20 + 10 + 5 \\ &= 35 \end{aligned}$$

19. What are distinct prime factors of the number 26381?

संख्या 26381 के विशिष्ट अभाज्य गुणखंड क्या हैं?

[CDS - 2021 (II)]

- ~~(a)~~ 29, 17, 37
- ~~(c)~~ 19, 37, 13

- ~~(b)~~ 31, 17, 47
- (d) 23, 31, 37

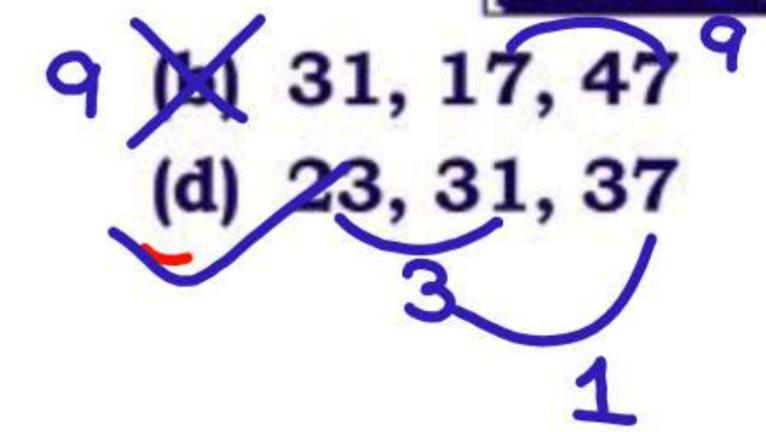
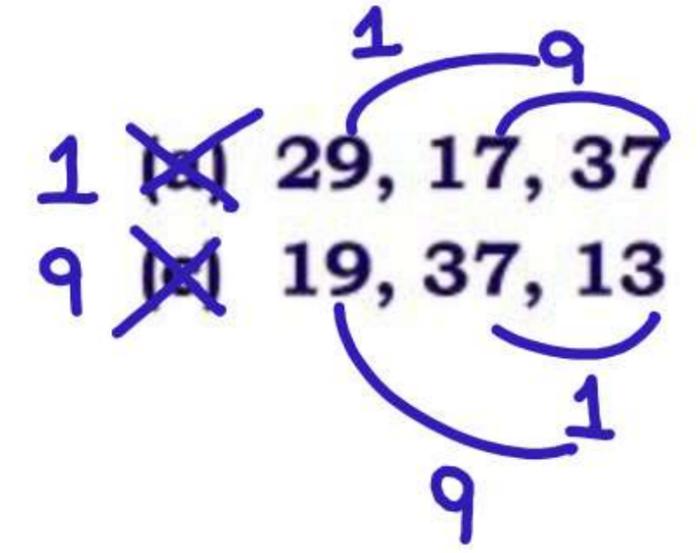
$$\begin{array}{r} 17 \overline{) 26381} \\ \underline{17} \\ 93 \\ \underline{85} \\ 88 \\ \underline{85} \\ 31 \end{array}$$

$$\begin{array}{r} 13 \overline{) 26381} \\ \underline{26} \\ 38 \\ \underline{26} \\ 121 \end{array}$$

19. What are distinct prime factors of the number 26381?

संख्या 26381 के विशिष्ट अभाज्य गुणखंड क्या हैं?

[CDS - 2021 (II)]



19. What are distinct prime factors of the number 26381? = 2

संख्या 26381 के विशिष्ट अभाज्य गुणखंड क्या हैं?

[CDS - 2021 (II)]

- (a) ~~29~~, 17, 37 = 3
 - (c) ~~19~~, 37, 13 = 4
- Handwritten notes for (a): $2 \times 8 \times 1$ above the numbers, and a bracket under 1, 1, 4 below the numbers.

- (b) 31, 17, 47 = 1
 - (d) 23, 31, 37 = 2
- Handwritten notes for (d): 4, 8, 2 above the numbers, and a bracket under 5, 4, 1 below the numbers.

256

No. of perfect square = ?

Sum " " " = ?

$$256 = 2^8$$

~~1, 2, 4, 8, 16, 32, 64, 128, 256~~

$$n = 5$$

$$\text{Sum} = 1 + 4 + 16 + 64 + 256 \\ = 341$$

$$\text{Sum} = (2^0 + 2^2 + 2^4 + 2^6 + 2^8) \\ = (1 + 4 + 16 + 64 + 256)$$

$$n = 5$$

$$\text{Sum} = 341$$

243

no. of perfect cubes = 2

sum " " cube = 28

$$243 = 3^5$$

$$\begin{aligned} \text{sum} &= (3^0 + 3^3) \\ &= (1 + 27) \\ &= 28 \end{aligned}$$

20. The sum of divisors of 10800 which are perfect square.

10800 के उन गुणखंडों का योग ज्ञात कीजिए जो पूर्ण वर्ग है।

(a) 393120

(b) 6240

(c) 5200

(d) 5460

$$10800 = 2^4 \times 3^3 \times 5^2$$

$$\begin{aligned} \text{Sum} &= (2^0 + 2^2 + 2^4) \times (3^0 + 3^2) \times (5^0 + 5^2) \\ &= (1 + 4 + 16) \times (1 + 9) \times (1 + 25) \\ &= 21 \times 10 \times 26 \\ &= \underline{5460} \end{aligned}$$

21. The number of factor of 7200 divisible by 40.

7200 के 40 से विभाज्य गुणखंडों की संख्या है :

- (a) 18
- (c) 9

- (b) 54
- (d) 20

Step 1:
$$\begin{array}{r} 180 \\ \cancel{7200} \\ \hline \cancel{40} \end{array}$$

Step 2:
$$180 = 2^2 \times 3^2 \times 5^1$$

$$\begin{aligned} \text{N.O.F} &= 3 \times 3 \times 2 \\ &= 18 \end{aligned}$$

$24 \rightarrow 1 \times 24 \checkmark$
 $2 \times 12 \checkmark$
 $3 \times 8 \checkmark$
 $4 \times 6 \checkmark$

4 ways

or

$24 = 2^3 \times 3^1$

$N.O.F = 4 \times 2 = 8$

no. of ways = ~~8~~ 4 ways

Find the ways to express 24 as product of two factors.

24 को दो गुणखण्डों के गुणनफल के रूप में व्यक्त करने के तरीकों की संख्या ज्ञात करें।

$$\begin{aligned} 240 &= 24 \times 10 \\ &= 2^3 \times 3 \times 2 \times 5 \\ &= 2^4 \times 3^1 \times 5^1 \end{aligned}$$

$$N.O.F = 5 \times 2 \times 2 = 20$$

$$Ans = \frac{24}{2} = \underline{\underline{10}}$$

22. Find the ways to express 240 as product of two factors.

240 को दो गुणखण्डों के गुणनफल के रूप में व्यक्त करने के तरीकों की संख्या ज्ञात करें।

- (a) 10
- (b) 11
- (c) 64
- (d) 20

$$25 = \left. \begin{matrix} 1 \times 25 \\ 5 \times 5 \end{matrix} \right\} 2 \text{ ways}$$

or

$$25 = 5^2$$

$$N.O.F = \textcircled{3} \quad \checkmark$$

$$ans = \frac{3+1}{2} = 2$$

Find the ways to express 25 as product of two factors.

25 को दो गुणखण्डों के गुणनफल के रूप में व्यक्त करने के तरीकों की संख्या ज्ञात करें।

- (a) 1
- (b) 4
- (c) 2
- (d) 3

23. Find the ways to express 11025 as product of two factors.

11025 को दो गुणखण्डों के गुणनफल के रूप में व्यक्त करने के तरीकों की संख्या ज्ञात करें।

- (a) 13
- (c) 27

- (b) 14
- (d) 30

$$11025 = 5^2 \times 3^2 \times 7^2$$

$$N.O.F = 3 \times 3 \times 3 = 27$$

$$ans = \frac{27+1}{2} = 14$$

80 = ~~1 x 80~~
 2 x 40
 4 x 20
 5 x 16
 8 x 10

$n=8$

The number of divisors of the number 80 , exclusive of the divisors 1 and itself, is

संख्या 80 के भाजकों की संख्या, विभाजकों 1 और खुद इस संख्या को छोड़कर, कितनी है?

[CDS - 2018 (II)]

or

$80 = 2^4 \times 5^1$

N.O.F = $5 \times 2 = 10$ //

Ans = $10 - 1 - 1$
 = 8 //

24. The number of divisors of the number 38808, exclusive of the divisors 1 and itself, is

संख्या 38808 के भाजकों की संख्या, विभाजकों 1 और खुद इस संख्या को छोड़कर, कितनी है?

[CDS - 2018 (II)]

(a) 74

(b) 72

(c) 70

(d) 68

$$38808 = 2^3 \times 3^2 \times 7^2 \times 11$$

$$N.O.F = 4 \times 3 \times 3 \times 2 = 72$$

$$\begin{aligned} \text{ans} &= 72 - 1 - 1 \\ &= \underline{\underline{70}} \end{aligned}$$