Simplification

Type

गुणनखण्डों की संख्या ज्ञात करने पर आधारित प्रश्न

72 → 2 × 36
2 × 2 × 18
2 × 2 × 2 × 9
$= 2^3 \times 3^2$

{1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72}
= 195

i) Total → 4 × 3 = 12
ii) Even → 3 × (2 + 1) = 9
iii) odd → (2 + 1) = 3
iv) prime → 3 + 2 = 5

$4^\circ = 3^\circ = 2^\circ = 1$.

i) **सभी गुणनखण्डों का योग (Sum of all factors)**

$\Rightarrow (2^0 + 2^1 + 2^2 + 2^3) \times (3^0 + 3^1 + 3^2)$
$\Rightarrow (1 + 2 + 4 + 8) \times (1 + 3 + 9)$
$\Rightarrow 15 \times 13 = 195$

ii) **सम गुणनखण्डों का योग (Sum of even factors)**

$n^\circ = 1$. 6

$\Rightarrow (2^1 + 2^2 + 2^3) \times (3^0 + 3^1 + 3^2)$
$\Rightarrow (2 + 4 + 8) \times (1 + 3 + 9)$
$\Rightarrow 14 \times 13$ 4
$\Rightarrow 182$

72 → $2^3 \times 3^2$

{1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72}
= 195
− 13
182

24 → $2^3 \times 3^1$

सभी गुणनखण्डों का योग (Sum of all factors)

$\Rightarrow (2^0 + 2^1 + 2^2 + 2^3) \times (3^0 + 3^1)$
$\Rightarrow (1 + 2 + 4 + 8) \times (1 + 3)$
$\Rightarrow 15 \times 4 = 60$

1 2 3 4 6 8 12 + 24 = 60

सम गुणनखण्डों का योग (Sum of even factors)

$\Rightarrow (2^1 + 2^2 + 2^3) \times (3^0 + 3^1)$
$\Rightarrow 14 \times 4 = 56$

60 − 56.

Simplification

40 के सभी गुणनखण्डों का योग = ? Sum of all factors of 40 ?

40 → 1, 2, 4, 8, 10, 20, +40 = 90 (विषम)

$k^2 \times k^7 \Rightarrow k^{2+7} \Rightarrow k^9$

$40 \rightarrow 4 \times 10$

$5 \times 8 \Rightarrow 2^2 \times 2^1 \times 5$

$5 \times 2^3 \Rightarrow 2^3 \times 5^1$

सभी गुणनखण्डों का योग $\Rightarrow (2^0+2^1+2^2+2^3) \times (5^0+5^1)$ विषम

सम का योग $\Rightarrow (2^1+2^2+2^3) \times (5^0+5^1) \Rightarrow 15 \times 6 = 90$

$14 \times 6 = 84$

3. What will be the sum of even factors of 1400?

1400 के विषम गुणनखण्डों का योगफल क्या होगा?

(a) 3472
(b) 4434
(c) 3481
(d) 3473

Solve:

सम गुणनखण्डों का योग $\Rightarrow (2^1+2^2+2^3) \times (5^0+5^1+5^2) \times (7^0+7^1)$

$\Rightarrow (2+4+8) \times (1+5+25) \times (1+7)$

$\Rightarrow 14 \times 31 \times 8$

$\Rightarrow __ \times 2 \quad 14 \times 248 = 3472$

$1400 \Rightarrow 14 \times 100$

$\Rightarrow 2 \times 7 \times 4 \times 25$

$\Rightarrow 2^1 \times 7 \times 2^2 \times 5^2$

$\Rightarrow 2^3 \times 5^2 \times 7$

अभाज्य

विषम गुणनखण्डों का योग $\Rightarrow$

$\Rightarrow (5^0+5^1+5^2) \times (7^0+7^1)$

$\Rightarrow 31 \times 8 \Rightarrow 248$

1500 के —

i.) कुल गुणनखण्डों की संख्या $\Rightarrow 24$

ii.) सम गुणनखण्डों की संख्या $\Rightarrow 16$

iii.) विषम गुणनखण्डों की संख्या $\Rightarrow 8$

iv.) अभाज्य गुणनखण्डों की संख्या $\Rightarrow 6$

$1500 = 15 \times 100$

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

$\Rightarrow 2^2 \times 3^1 \times 5^3$

v.) सभी गुणनखण्डों की योग $\Rightarrow (2^0+2^1+2^2) \times (3^0+3^1) \times (5^0+5^1+5^2+5^3) = 4368$

$7 \times 4 \times 156 = 7 \times 624$

vi.) सम गुणनखण्डों का योग $\Rightarrow (6 \times 4 \times 156) \Rightarrow 6 \times 624 \Rightarrow 3744$

vii.) विषम गुणनखण्डों का योग $\Rightarrow 4 \times 156 = 624$

Simplification

1700 के सभी विषम गुणनखण्डों का योग = ?

$1700 = 17 \times 100$

$\Rightarrow 17 \times 4 \times 25$

$\Rightarrow 17 \times 2^2 \times 5^2$

$\Rightarrow 2^2 \times 5^2 \times 17^1$

विषम गुणनखण्डों का योग $= (5^0+5^1+5^2) \times (17^0+17^1)$

$= (1+5+25) \times (1+17)$

$\Rightarrow 31 \times 18$

$\Rightarrow$ **558** Ans.

5. Find the number of prime factors in the product $(30)^5 \times (24)^5$. + गुणनफल $(30)^5 \times (24)^5$ में, अभाज्य गुणनखण्डों की संख्या ज्ञात कीजिए।

(a) 45
(b) 10
(c) **35**
(d) 30

Solve:

अभाज्य गुणनखण्डों की संख्या $\Rightarrow$ $20+10+5 \Rightarrow$ **35.**

कुल गुणनखण्ड $\Rightarrow 21 \times 11 \times 6$

$\Rightarrow 21 \times 66$

$\Rightarrow$ **1386.**

$(30)^5 \times (24)^5$

$(2 \times 3 \times 5)^5 \times (2 \times 2 \times 2 \times 3)^5$

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

$\Rightarrow 2^{20} \times 3^{10} \times 5^5$

$(12)^6 \times (18)^3 \times (20)^4$ में $\Rightarrow$

i.) Total $\rightarrow 24 \times 13 \times 5 \Rightarrow 1560$

ii.) Even $\rightarrow 23 \times 13 \times 5 \Rightarrow 1495$

iii.) Odd $\rightarrow 13 \times 5 \Rightarrow 65$

iv.) Prime $\rightarrow 23 \times 12 \times 4 \Rightarrow 39$

$(2 \times 2 \times 3)^6 \times (2 \times 3 \times 3)^3 \times (2 \times 2 \times 5)^4$

$\Rightarrow 2^6 \times 2^6 \times 3^6 \times 2^3 \times 3^3 \times 3^3 \times 2^4 \times 2^4 \times 5^4$

$\Rightarrow 2^{23} \times 3^{12} \times 5^4$

6. What is the total number of factors of the number 840 except 1 and the number itself?

संख्या 840 के गुणनखण्डों की कुल संख्या 1 और स्वयं संख्या को छोड़कर कितनी है?

(a) 28
(b) 31
(c) **30**
(d) 29

Solve:

कुल गुणनखण्ड $\Rightarrow 4 \times 2 \times 2 \times 2$

$\Rightarrow 32$

$-1, -840$

30

$840 \Rightarrow 84 \times 10$

$= 21 \times 4 \times 2 \times 5$

$\Rightarrow 3 \times 7 \times 2^2 \times 2 \times 5$

$\Rightarrow 2^{(3)} \times 3^{(1)} \times 5^{(1)} \times 7^{(1)}$

Simplification

7. What is the total number of factors of the number 720 except 1 and the number itself?
संख्या 720 के गुणनखण्डों की कुल संख्या 1 और स्वयं को छोड़कर कितनी है?

(a) 29
(b) 27
(c) 32
(d) 28

Solve:

$720 \Rightarrow 72 \times 10$
$= 8 \times 9 \times 2 \times 5$
$\Rightarrow 2^3 \times 3^2 \times 2^1 \times 5$
$\Rightarrow 2^4 \times 3^2 \times 5^1$

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

$72 \Rightarrow 2 \times 36$
3×24
4×18
6×12
8×9
9×8

Type

Question Based on VBODMAS.

+ V → Vinaculum Bar / Bar Bracket.
+ B → Bracket ( ), { }, [ ]
+ O → Of (का) → (गुणा)(×)
+ D → Divide → (भाग)
+ M → Multiplication → (गुणा)
+ A → Addition - (जोड़)
+ S → Subtraction (घटना)

1. $1-[1-\{1-(1+|2-3|)\}] = ?$

(a) 1
(b) -1
(c) 0
(d) 2

Solve: Modulus

$1-[1-\{1-(1+|2-3|)\}]$
$\Rightarrow 1-[1-\{1-(1+1)\}]$
$\Rightarrow 1-[1-\{1-2\}]$
$\Rightarrow 1-[1-\{-1\}]$
$\Rightarrow 1-[1+1]$
$\Rightarrow 1-[2] \Rightarrow 1-2$
$\Rightarrow -1$

Modulus

$|2-3| = 1$
$|3-1| = 2$
$|1-6| = 5$
$|10-19| = 9$
$10-19 = -9.$

Simplification

2. $\frac{8-[5-(-1)]\div 2}{|2|-|-3|\div 3} = ?$

(a) $\frac{5}{3}$

(b) **5**

(c) 1

(d) $\frac{5}{2}$

Solve:

$$\frac{8-[5-(-1)]\div 2}{|2|-|-3|\div 3}$$

$$\Rightarrow \frac{8-[5+1]\div 2}{2-3\div 3} \Rightarrow \frac{8-6\div 2}{2-3\div 3} = \frac{8-3}{2-1} \Rightarrow \frac{5}{1}$$

3. The value of $10.5-[6.5-\{3.3-(3.2-\overline{2.2-1.8})\}]$ is –

$10.5-[6.5-\{3.3-(3.2-\overline{2.2-1.8})\}]$ का मान है – (vinculum)

(a) 2

(b) 3.2

(c) **4.5**

(d) 5.3

Solve:

$(3.2-0.4)$

$\{3.3-2.8\}]$

$[6.5-\{0.5\}]$

$10.5-[6]$

$\Rightarrow$ **4.5**

4. $1\div[1+1\div\{1+1\div(1+1\div 2)\}] = ?$

(a) 1

(b) $\frac{5}{8}$

(c) 2

(d) $\frac{1}{2}$

Solve:-

$1\div[1+1\div\{1+1\div(1+\frac{1}{2})\}]$

$\{1+1\div(\frac{3}{2})\}$

$\{1+1\times\frac{2}{3}\}$

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

$\{\frac{5}{3}\}$

$1\div[1+1\div\{\frac{5}{3}\}]$

$\Rightarrow 1\div[1+1\times\frac{3}{5}]$

$\Rightarrow 1\div[1+\frac{3}{5}]$

$\Rightarrow 1\div\frac{8}{5}]$

$\Rightarrow 1\times\frac{5}{8} = \frac{5}{8}$ Ans.

6. Evaluate का मान करें।

$$\frac{9.|3-5|-5|4|\div 10}{-3(5)-2\times 4\div 2} = ?$$

(a) $\frac{9}{10}$

(b) $\frac{-8}{17}$

(c) $\frac{-16}{19}$

(d) $\frac{4}{7}$

Solve:-

$$\frac{9\times|-2|-\frac{5\times 4^2}{10\cancel{2}}}{-3\times 5-2\times\cancel{4}^{2}}$$

$$\Rightarrow \frac{9\times 2-2}{-15-4} \Rightarrow \frac{18-2}{-19} = \frac{16}{-19}$$

Simplification

7. Simplify the following equation.
निम्नलिखित समीकरण को सरलीकृत करें।

$$\frac{23 \times 552 \div 24 + 23}{552 \div 23 - 1} = ?$$

(a) 25
(b) 23
(c) 26
(d) 24

Solve:

$$\frac{23 \times \frac{552}{24} + 23}{\frac{552}{23} - 1}$$

$$\Rightarrow \frac{23 \times 23 + 23}{24 - 1}$$

$$\Rightarrow \frac{23 \times 23 + 23}{23}$$

$$\Rightarrow \frac{23[23+1]}{23} \Rightarrow 24$$

$$\Rightarrow \frac{529+23}{23} \Rightarrow \frac{552}{23} \Rightarrow 24$$

8. $\frac{29 \times 870 \div 30 + 29}{870 \div 29 - 1} = ?$

(a) 32
(b) 31
(c) 29
(d) 30

Solve:

$$\frac{29 \times \frac{870}{30} + 29}{\frac{870}{29} - 1} = \frac{29 \times 29 + 29}{30 - 1} = \frac{29 \times 29 + 29}{29}$$

$$\Rightarrow \frac{29[29+1]}{29} \Rightarrow 30$$

9. $79 - [23 - \{84 \div 7 - (16 - 4) \div 4)\}]$

(a) 61
(b) 63
(c) 67
(d) 65

Solve:-

$\Rightarrow 79 - [23 - \{12 - 12 \div 4\}]$

$\Rightarrow 79 - [23 - \{12 - 3\}]$

$\Rightarrow 79 - [23 - 9]$

$\Rightarrow 79 - 14 \Rightarrow 65$

10. $49 - [16 + \{39 - (29 - 7)\}] = ?$

(a) 17
(b) 19
(c) 18
(d) 16

Solve:

$49 - [16 + \{39 - 22\}]$

$\Rightarrow 49 - [16 + 17]$

$\Rightarrow 49 - 33 \Rightarrow 16$

14. $\sqrt{(189 - k)} = \sqrt{(178 - \sqrt{81})}$

(a) 20 (b) 27 (c) 38 (d) 49

Simplification

(11.) Solve :-

$[189 - K]^2 = [178 - \sqrt{81}]^2$

$\Rightarrow 189 - K = 178 - \sqrt{81}$

$\Rightarrow 189 - K = 178 - 9$

$\Rightarrow 189 - K = 169$

$\Rightarrow 189 - 169 = K$

$20 = K$

12. $\sqrt{(157) - \sqrt{182 - \sqrt{156 + \sqrt{(169)}}}}$

(a) 11
(b) 12
(c) 14
(d) 13.

Solve :

$\Rightarrow \sqrt{157 - \sqrt{182 - \sqrt{156 + 13}}}$ (169)

$\Rightarrow \sqrt{157 - \sqrt{182 - 13}}$

$\Rightarrow \sqrt{157 - 13} \Rightarrow \sqrt{144} = 12$

$156 + 13 = 169$
$182 - 13 = 169$
$157 - 13 = 144.$

13. $\{2^4 \div 8\}^4 + \sqrt{(135 - \sqrt{196})}$

(a) 42
(b) 37
(c) 27
(d) 13

Solve :

$\left[\frac{2^4}{8}\right]^4 + \sqrt{135 - 14}$

$\left[\frac{{}^{2}\cancel{16}}{\cancel{8}}\right]^4 + \sqrt{121}$

$2^4 + 11 \Rightarrow 16 + 11 = 27.$

14. $\sqrt{(343) - \sqrt{(380 - \sqrt{(343 + \sqrt{324}))}}}$

(a) 12
(b) 21
(c) 38
(d) 18

Solve: 361 → 19 → 19 ; 324 → 18 ; 343 − 19 = 324 = 18

17. $49 - [35 + \{12 \div 3 \text{ of } (6 + 7 - 12)\}]$ का मान ज्ञात कीजिए।

Solve :-

$49 - [35 + \{12 \div 3 \text{ of } (6 + (-5))\}]$

$49 - [35 + \{12 \div 3 \text{ of } (6 - 5)\}]$

Simplification

$\Rightarrow 49-[35+\{12\div 3\times 1\}]$

$\Rightarrow 49-[35+\{\frac{12}{3}\}]$

$\Rightarrow 49-[35+4] \Rightarrow 49-39 = \boxed{10}$

18. $22-[23-\{24-(27-\overline{25-30})\}]=?$

(a) 7

(b) -7

(c) -9

(d) -8

Solve:

$27-(-5)$

$27+5$

$\Rightarrow \{24-32\}$

$\Rightarrow [23-\{-8\}]$

$\Rightarrow [23+8] \Rightarrow 22-31 \Rightarrow \boxed{-9.}$