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Q a^3b^2, 3 diff a, 2 diff b.

No W to Select atleast 1 object?

$\boxed{M_1}$ $(2^3)\times(2^2)-1 = 2^5-1 = 32-1$

$= 31$

Apple लेने या न लेने के total Ways

banana लेने या न लेने के total Ways

Basic Rem: $\left({}^3C_0+{}^3C_1+{}^3C_2+{}^3C_3\right)\times\left({}^2C_0+{}^2C_1+{}^2C_2\right)-1$

M_2 $(1+3+3+1)(1+2+1)-1$

Different $8\times4=32-1=31$ Ans

Q $a^5b^4O^3$ No of ways to select atleast 1 object.

$(2^5)(2^4)(2^3)-1 = 2^{12}-1 = 4095$

Select
- alike
  - atleast 1 Select: n
  - atleast 1 Select or not Select: $(n+1)$
- diff
  - atleast 1 Select: 2^n-1
  - atleast 1 Select or not select: 2^n

Q $a^5b^4O^3$ (diff) No of ways to select atleast 1 "a"

$(2^5-1)(2^4)(2^3)$

$31\times16\times8$

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Q $a^5 b^4 O^3$ diff, NOW to Select atleast 1 A, 1 banana.

$(2^5-1)\times(2^4-1)(2^3)$

$(31)(15)\times 8$

Basic Method | $({}^5C_1+{}^5C_2+{}^5C_3+{}^5C_4+{}^5C_5)({}^4C_1+{}^4C_2+{}^4C_3+{}^4C_4)({}^3C_0+{}^3C_1+{}^3C_2+{}^3C_3)$

Q $a^5 b^4 O^3$ NOW to select atleast 1 apple & atleast 2 Banana?

$({}^5C_1+{}^5C_2+{}^5C_3+{}^5C_4+{}^5C_5)({}^4C_2+{}^4C_3+{}^4C_4)({}^3C_0+{}^3C_1+{}^3C_2+{}^3C_3)$

$(2^5-1) \quad (6+4+1) \quad (1+3+3+1)$

$31 \times 11 \times (8)$

Q 5 alike apple, 5 diff B, 3 diff Orange NOW to select atleast 1 fruit.

$(5+1)\times(2^5)\times(2^3)-1$

Q 5 diff. greendices, 3 diff. Red dices, 4 diff Blue dices NOW to Select at least 1 dice

$(2^5)(2^3)(2^4)-1$

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Q How to Select atleast one alphabet from word MATHEMATICS.

2M, 2A, 2T, EHICS

$(2+1)(2+1)(2+1)(2^5)-1$

$3\times3\times3\times32-1$

Q No. of divisors of 7875?

5	7875
5	1575
5	315
7	63
9	9

$7875 = 3^2 \cdot 5^3 \cdot 7^1$

2 alike 3, 3 alike 5, 1 alike 7

$(2+1)\times(3+1)(1+1)$

$3\times4\times2 = 24$ divisor.

$\frac{7875}{1}, \frac{7875}{7875}$

$(3^0+3^1+3^2)\times(5^0+5^1+5^2+5^3)\times(7^0+7^1)$

$3^0 5^0 7^0$

$3^1 5^0 7^0$
$3^2 5^0 7^0$
$3^0 5^1 7^0$
$3^0 5^2 7^0$
$3^0 5^3 7^0$
$3^0 5^0 7^1$
$3^1 5^0 7^1$

$3^1 5^1 7^1$
$3^0 5^1 7^1$
$3^2 5^0 7^1$
$3^2 5^1 7^0$
$3^2 5^1 7^1$
$3^2 5^2 7^1$
$3^2 5^3 7^1$
$3^1 5^2 7^0$
$3^1 5^3 7^0$

$3^1 5^2 7^1$
$3^1 5^3 7^1$

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① Consider 75600

$$75600 = 2^4 3^3 5^2 \cdot 7^1$$

$2^1 3^0 5^0 7^0 = 2$
$2^0 3^1 5^0 7^0 = 3$
$2^0 3^0 5^1 7^0 = 5$
$2^0 3^0 5^0 7^1 = 7$

① Find No. of divisor.

$$= (4+1)(3+1)(2+1)(1+1)$$

$$= 5 \times 4 \times 3 \times 2 = 120$$

(2) Find Proper Divisor (Excepts 1 & itself)

$$= 120 - 2 = 118$$

(3) No of Even divisor (2 को तो लेना ही पड़ेगा)

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

$$16 \times 6 = 96$$

(4) No of odd Divisors (Ab 2 नहीं Lena)

2^0 चाहिए

$$(1)(3+1)(2+1)(1+1) = 4 \times 3 \times 2 = 24$$

(5) No of divisor divisible by 14.

$2^1 \times 7^1$

2^0 Remove $\quad 7^0$ Remove

$$4 \times (3+1)(2+1)(1) = 48$$

$$(2^1+2^2+2^3+2^4) \times (3^0+3^1+3^2+3^3)(5^0+5^1+5^2)(7^1)$$

(6) No of divisor divisible by 35. $(5^1 \times 7^1)$

$$(4+1)(3+1)(2)(1) = 5 \times 4 \times 2 = 40$$

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(7) No of divisor divisible by 12.

$(2^2 \times 3^1)$

$2^0, 2^1$ Remov. , 3^0 Re.

$(2^2+2^3+2^4)(3^1+3^2+3^3)(5^0+5^1+5^2)(7^0+7^1)$

$3 \times 3 \times 3 \times 2 = 54$

(8) Sum of all divisor.

$2^0 3^0 5^0 7^0$
$2^1 3^0 5^0 7^0$
$2^2 3^0 5^0 7^0$
$2^3 3^0 5^0 7^0$
$\vdots$
$2^4 3^3 5^2 7^1$

Sum.

$(2^0+2^1+2^2+2^3+2^4)(3^0+3^1+3^2+3^3)(5^0+5^1+5^2)(7^0+7^1)$

$$\frac{1 \times 2^5-1}{2-1} \times \frac{1 \times (3^4-1)}{(3-1)} \times \frac{1 \times (5^3-1)}{(5-1)} \times \frac{1\,(7^2-1)}{(7-1)}$$

$$31 \times \frac{80}{2} \times \frac{124}{4} \times \frac{48}{6}$$

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Q $N = p_1^{\alpha_1} \cdot p_2^{\alpha_2} \cdot p_3^{\alpha_3} \cdots p_r^{\alpha_r}$

(1) No. of divisors $= (\alpha_1+1)(\alpha_2+1)(\alpha_3+1)\cdots(\alpha_4+1)$

(2) No of Proper div $= (\alpha_1+1)(\alpha_2+1)\cdots(\alpha_r+1) - 2$

(3) No. of Prime Div. $= r$.

(4) No of Non Prime Div $= (\alpha_1+1)(\alpha_2+1)\cdots(\alpha_r+1) - r$

(5) No. of divisor divisible by $p_1 = (\alpha_1)(\alpha_2+1)(\alpha_3+1)\cdots(\alpha_r+1)$

(6) No of divisor ——— $p_3 = (\alpha_1+1)(\alpha_2+1)\boxed{\alpha_3}\cdots(\alpha_r+1)$

(7) Sum of all divisor $= \frac{(p_1^{\alpha_1}-1)}{(p_1-1)} \cdot \frac{(p_2^{\alpha_2}-1)}{(p_2-1)} \cdots \frac{(p_r^{\alpha_r}-1)}{(p_r-1)}$