

nCr \rightarrow combination.

r elements from n options.

$$nCr = \frac{n!}{(n-r)!r!}$$

$${}^3C_2 = \frac{3!}{1! \times 2!} = \underline{3}.$$

$${}^nC_r = \frac{n!}{(n-r)! r!}$$

$$\% \quad 10^9 + 7.$$

$$10^9 + 7 = \boxed{1000000007}$$

x , y

✓ answers should be $< \textcircled{8}$

$$n = 45 \% \underline{8}$$

$$0 < 8$$

$$\textcircled{3}$$

$$36 \% \underline{5}$$

$$=$$

$$73 \% \textcircled{4}$$

~~0 1 2 3 4 5~~

$$\begin{array}{r} 18 \\ 4 \overline{) 73} \\ \underline{4} \\ 33 \\ \underline{32} \\ 1 \end{array}$$

$$\textcircled{22}$$

$$\begin{array}{r} x = 8 \\ y = 17 \end{array}$$

$$\underline{\hspace{1cm}} 25 \% \underline{8}$$

$$= \textcircled{1}$$

$$127$$

$$\textcircled{\% \textcircled{5}}$$

$$=$$

$$\begin{array}{r} 0 < 5 \\ 1 \overline{) 01234} \\ \underline{0} \checkmark \\ 1 \checkmark \end{array}$$

2147483647

1 2 3 4 5 6 7 8 9 10

$\cdot nCr$

$$n=1000$$
$$r=200$$

$$\frac{1000!}{800! \cdot 200!} =$$

yes ↑

res. $\begin{cases} \text{int} \\ \text{long} \end{cases}$

1000!

res ↑

} int
long.

$$\% \quad 10^9 + 7.$$

$$\text{res. \% } \underline{\underline{\text{const.}}}$$

$$[0 \text{ --- } \text{const}-1]$$

$$(3 + 5) \% 7$$

$$(3 \% 7 + 5) \% 7 = 1$$

$${}^nC_r = \frac{n!}{(n-r)! r!} \Rightarrow$$

factorial.
function.

$${}^nP_r = \frac{n!}{(n-r)!}$$

$${}_2C_1 = \frac{2!}{1!1!} = \frac{2!}{1!}$$

GCD :- Greatest or common divisor

HCF

Highest common factor

$$\text{gcd}(\underline{12}, 36) =$$

$$\begin{array}{l} \textcircled{4} < \textcircled{2} \\ \quad \quad 36 \end{array}$$

$$\begin{array}{ccccccc} 4 & \cdots & \textcircled{12} & 24 & 36 & 48 & \cdots \\ & & \uparrow & & & & \\ & & 36 & 7 \cdot 2 & \cdots & & \end{array}$$

gcd / HCF.

gcd.

$$\begin{array}{c} \textcircled{8, 36} \\ \searrow \\ \boxed{4} \end{array}$$

gcd.

12, 36

$$\begin{array}{l} 12 \% 13 = 0 \\ 36 \% 13 = 0 \end{array}$$

any no. (k) > $\min(x, y)$
cannot be gcd.

highest common factor.

$$as = x \neq y$$

(12)
actual.

$$\min(12, 36) = 12$$

gcd.
ans = 12

$$\left. \begin{array}{l} 12 \% 6 = 0 \\ 36 \% 6 = 0 \end{array} \right\} \text{break.}$$

$$ans = 1$$

eg. (7, 42)

$$\min(7)$$

$$\begin{array}{l} 42 \% 7 = \\ 7 \% 7 = \end{array}$$

ans = 7

$$\min = 7 = 0$$