

1.

$$10+3 \left\{ \right.$$

$$10-4+3 \left\{ \right.$$

$$R+W+G+B=10$$

2.

$$2^{+2} \subset 2^x \subset 2^{3+2} \subset 2^x \subset 2^{4+2} \subset 2$$



3.

$${}^{4+9}C_9, {}^{13}C_9 - {}^{10}C_4$$

$$\begin{aligned} 4A &\longrightarrow {}^{10}C_1 \\ 3A + 1D &\longrightarrow {}^{10}C_1 {}^9C_1 \\ 2A + 2D &\longrightarrow {}^{10}C_2 \\ 4D &\longrightarrow {}^{10}C_4 \end{aligned}$$

4. Find no. of triplets (x, y, z) satisfying
the eqn. $x + y + z = \underline{30}$, $x, y, z \in \mathbb{N}$ and

$$x < y < z \quad \begin{matrix} 1 & 2 & 27 \\ | & | & | \\ 1 & 1 & 28 \end{matrix} \quad 10, 10, 10$$

$$\frac{30-3+2}{2} - \left(13 \times 3 + 1 \right) \begin{matrix} 1! & 1! & 1! & 28 \\ 2! & 2! & 26 \\ 3! & 3! & 24 \\ \vdots & \vdots & \vdots \\ 14! & 14! & 2 \end{matrix}$$

1, 1, 1, 1, 1, 3 →

AAA	A	O	O	O	O	$\frac{6!}{4!}$
AAO	A	A	O	O	O	$\frac{6!}{3!2!}$
AOO	A	A	A	O	O	$\frac{6!}{3!2!}$
OOO	O	A	A	A	A	$\frac{6!}{4!}$

1, 1, 1, 1, 2, 2 →

AA	AA	O	O	O	O	→ $\frac{6!}{4!2!}$
AA	AO	A	O	O	O	→ $\frac{6!}{2!2!}$
AA	OO	A	A	O	O	→ $\frac{6!}{2!2!2!}$
AO	AO	A	A	A	O	→ $\frac{6!}{3!}$
AO	OO	OO	A	A	A	→ $\frac{6!}{4!2!}$

$$\binom{4+s}{s}^2 - \left[\binom{4+4}{4}^2 C_1 - \binom{4+3}{3}^2 C_2 + \dots \right]$$

$C_1 C_2 C_3 C_4 C_5 C_6$
 $AAAA OO$
 OO

$AAAAOO$
 OA

$AAOOOO$

DPP-10 (rem.)