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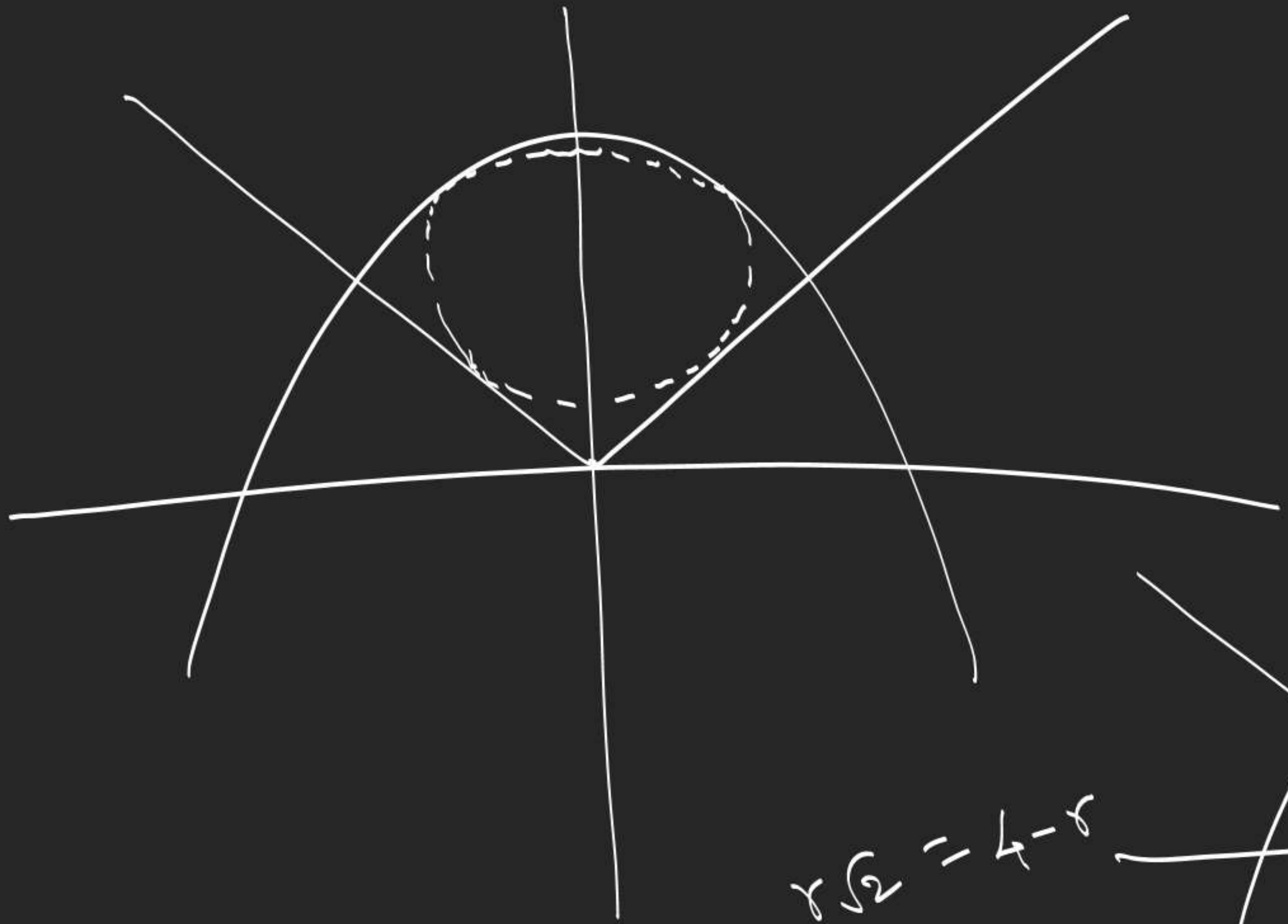

$r\sqrt{2} = 4 - r$

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Permutation

number of arrangements

A B

B A

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Combination

selection or collection

AB

BA

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$P(n,n) = {}^nP_n$ = no. of permutation of 'n' distinct objects taken all at a time.

$= n!$

n boys

_ _ _ _ _ . . . . _ _

n seats

$n \times (n-1) \times (n-2)(n-3) \times \cdots \times 1$

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$P(n,r) = {}^nP_r$ = no. of permutation of 'n' distinct objects taken 'r' at a time. $(0 \le r \le n)$

n Boys

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

__ __ __ __ __ __

r seats

$${}^nP_r = n \times (n-1) \times (n-2) \times (n-3) \cdots \cdots (n-(r-1)) = \frac{n(n-1)\cdots(n-r+1)(n-r)(n-r-1)\cdots \times 2 \times 1}{(n-r)(n-r-1)\cdots \times 2 \times 1}$$

Arrange 'n' boys in r seats

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

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Find no. of ways to arrange $\underline{\underline{6}}$ boys in 10 seats.

no. of permutation of 'n' boys in 'r' places $r > n$ $= {}^rP_n$

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10 seats

$$10 \times 9 \times 8 \times 7 \times 6 \times 5 = \frac{10!}{4!}$$

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$^nC_r = C(n,r) =$ no. of combinations of 'n' distinct objects taken 'r' at a time $(0 \le r \le n)$

$\underbrace{r! + r! + r! + \cdots r!}$

n Boys

$B_1 B_2 \cdots B_r \to r!$

$B_1 B_3 B_4 \cdots B_r B_{r+1} \to r!$

(no. of selection of r boys) times. $0 \le r \le n$

__ __ __

r seats

Find no. of ways to arrange 'n' boys in r seats

$$\boxed{^nP_r = {^nC_r} \times r!}$$

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