Combinations Ex 17.2 Q21

A decagon has 10 sides

By joining any two angular points

we get a line which is either a side or a diagonal

$\therefore$ number of lines $= {}^{10}C_2 = \frac{10!}{2!\,8!} = \frac{10\times 9}{2} = 45$

$\therefore$ number of sides $= 10$

$\therefore$ number of diagonals $= 45 - 10 = 35$

Also,by joining 3 angular points a triangle in formed

$= {}^{10}C_3$

$= \frac{10!}{3!\,7!} = \frac{10\times 9\times 8}{3\times 2} = \frac{720}{6} = 120$

$= 120$

Combinations Ex 17.2 Q22

Out of the 52 cards 4 are kings and 48 are Non-kings.

Five cards with at least one king

$=$ (one king and 4 non-kings) or (two kings and 3 non kings) or (3 kings and 2 non kings) or (4 kings and 1 non kings)

$= \left({}^4C_1 \times {}^{48}C_4\right) + \left({}^4C_2 \times {}^{48}C_3\right) + \left({}^4C_3 \times {}^{48}C_2\right) + \left({}^4C_4 \times {}^{48}C_1\right)$

$= 4\times\frac{48\times 47\times 46\times 45}{4\times 3\times 2} + \frac{4\times 3}{2}\times\frac{48\times 47\times 46}{3\times 2} + 4\times\frac{48\times 47}{2} + 1\times 48$

$= 778320 + 103776 + 4512 + 48$

$= 886656$

Required Number of ways $= 886656$

Combinations Ex 17.2 Q23

Total persons $= 8$ Selection to be made $= 6$ person.

If A is chosen then B must be chosen.

$\Rightarrow$ A and B are chosen together

$\therefore$ Selection can be made in

${}^6C_4 = \frac{6!}{4!\,2!} = \frac{6\times 5}{2} = 15$ ways

Also the number of selections in which A and B are not chosen are

${}^7C_6 = \frac{7!}{6!\,1!} = 7$ ways

Total number of ways in which selection is made $= 15 + 7$

$= 22$ ways

********** END **********