

• Seven persons A, B, C, D, E, F and G sit in a row facing North, but not necessarily in that order. The following information is known about them.

- (i) C sits four places away to the left of G.
  - (ii) C sits between B and D.
  - (iii) B sits to the right of G.
  - (iv) F sits exactly between B and E.
- Who sits second to the left of F?
- (A) A    (B) C    (C) E    (D) G
- Who sits exactly between E and D?
- (A) C    (B) A    (C) F    (D) G
- Who sits in the middle of the row?
- (A) D    (B) F    (C) E    (D) A
- Which of the following pairs of persons sit at the ends?
- (A) B, C    (B) B, D    (C) D, G    (D) C, G

• Seven girls – P, Q, R, S, T, U and V are seated in a row facing the same direction. The following information is known about them.

- Seven persons - P through V are sitting in a row facing the same direction, not necessarily in the same order. The following information is known about their seating arrangement.

- (i) The number of persons sitting to the left of Q is equal to the number of persons sitting to the right of S.
  - (ii) P sits exactly between R and T.
  - (iii) S sits third to the left of R.
  - (iv) Q sits two places away from U, who is at one of the ends.

- Who sits at the left end of the row?
 

(A) U	(B) S
(C) V	(D) Cannot be determined

- Who sits to the right of R?
 

(A) U	(B) T
(C) P	(D) Both P and T

- How many persons are sitting between T and R?  
(A) One    (B) Two    (C) Three    (D) Four

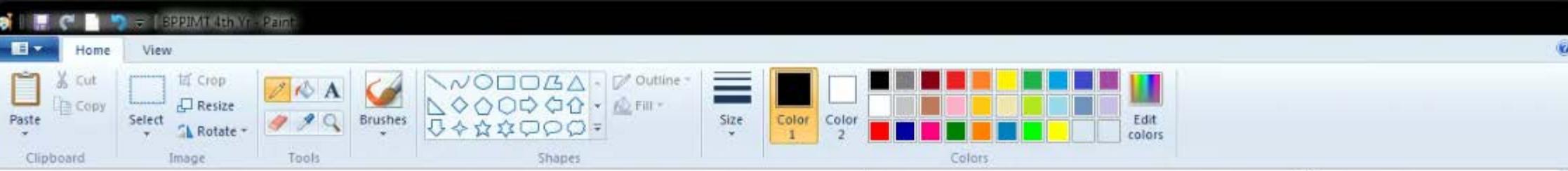
$\uparrow \text{---} \theta \text{---} \alpha \text{---} S \text{---} R$

卷之二

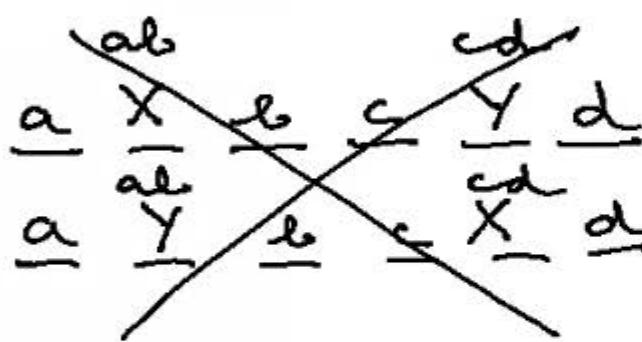
1

T S Q - R - -

$$\underline{S} = \underline{\underline{R}} \underline{\underline{Q}} - \underline{\underline{B}}$$



✓ (iii) If Q and S interchange their positions each of them gets exactly one new neighbour

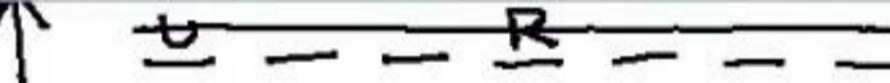


✓) {  
$$\begin{array}{cccc} a & \underline{\underline{ab}} & \underline{e} & \underline{\underline{bc}} \\ a & \underline{\underline{ab}} & \underline{Y} & \underline{\underline{bc}} \\ a & \underline{Y} & \underline{e} & \underline{\underline{bc}} \end{array} \subseteq$$

✓) {  
$$\begin{array}{cccc} a & \underline{\underline{aY}} & \underline{\underline{Xe}} & \underline{e} \\ a & \underline{ax} & \underline{ye} & \underline{l} \\ a & \underline{Y} & \underline{X} & \underline{\underline{el}} \end{array}$$

③) {  
$$\begin{array}{cccc} a & \underline{x} & \underline{a} & \underline{e} \\ a & \underline{Y} & \underline{a} & \underline{e} \end{array} \begin{array}{c} \underline{Y} \\ \underline{e} \end{array} \begin{array}{c} \underline{X} \\ \underline{l} \end{array}$$

- (A) B, C    (B) B, D    (C) D, G    (D) C, G



TPSUVQR  
TVSUVQPR

**V.** Seven girls – P, Q, R, S, T, U and V are seated in a row facing the same direction. The following information is known about them.

- (i) R is three places away to the right of U.
- (ii) T is at the left end and S is to the left of U.
- (iii) If Q and S interchange their positions each of them gets exactly one new neighbour.
- (iv) R is to the right of both P and V.

• If S sits to the immediate right of P then who will be to the immediate left of V?

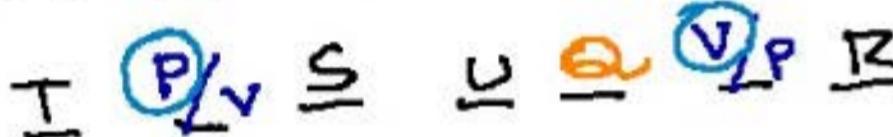
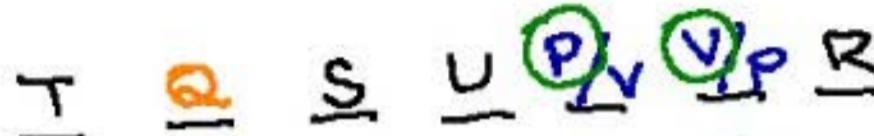
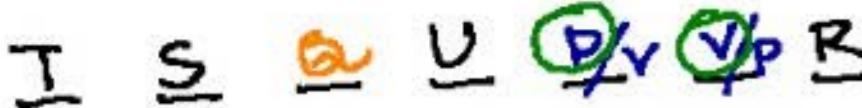
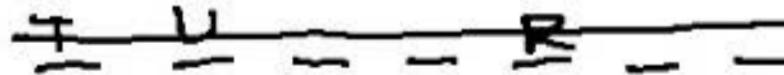
- (A) Q    (B) S    (C) R    (D) U

• If Q and S are not adjacent to each other then in how many ways can these seven girls be seated?

- (A) 1    (B) 3    (C) 2    (D) 4

• If U sits to the immediate left of P, then who will be the second from the right end?

- (A) P    (B) V  
(C) Q    (D) Cannot be determined



- Five girls ( $G_1$ ,  $G_2$ ,  $G_3$ ,  $G_4$  and  $G_5$ ) sit in one row facing north and five boys ( $B_1$ ,  $B_2$ ,  $B_3$ ,  $B_4$ , and  $B_5$ ) sit in another row facing south not necessarily in the same order. Each boy is facing a girl.

It is also known that:

- (I)  $G_3$  and  $B_5$  sit opposite each other.
- (II) Neither  $B_3$  nor  $B_4$  sits opposite  $G_2$ .
- (III)  $G_5$  sits second to the right of  $G_1$  and to the immediate left of  $G_4$ .
- (IV)  $B_5$  sits exactly in the middle of the row.
- (V)  $B_2$  sits between  $B_3$  and  $B_5$ .

- Which of the following pairs sit at the ends?

- |                     |                     |
|---------------------|---------------------|
| (A) $B_3$ and $G_5$ | (B) $B_4$ and $G_4$ |
| (C) $B_1$ and $G_1$ | (D) $B_3$ and $G_2$ |

Five girls ( $G_1$ ,  $G_2$ ,  $G_3$ ,  $G_4$  and  $G_5$ ) sit in one row facing north and five boys ( $B_1$ ,  $B_2$ ,  $B_3$ ,  $B_4$ , and  $B_5$ ) sit in another row facing south not necessarily in the same order. Each boy is facing a girl.

It is also known that:

- (I)  $G_3$  and  $B_5$  sit opposite each other.
- (II) Neither  $B_3$  nor  $B_4$  sits opposite  $G_2$ .
- (III)  $G_5$  sits second to the right of  $G_1$  and to the immediate left of  $G_4$ .
- (IV)  $B_3$  sits exactly in the middle of the row.
- (V)  $B_2$  sits between  $B_3$  and  $B_5$ .

- Which of the following pairs sit at the ends?  
(A)  $B_3$  and  $G_5$       (B)  $B_4$  and  $G_4$   
(C)  $B_1$  and  $G_1$       (D)  $B_3$  and  $G_2$

- Who sits opposite  $G_4$ ?  
(A)  $B_1$       (B)  $B_2$       (C)  $B_3$       (D)  $B_4$
- If  $B_4$  and  $B_2$  interchange their positions, then who sits opposite  $B_2$ ?  
(A)  $G_1$       (B)  $G_5$       (C)  $G_2$       (D)  $G_4$

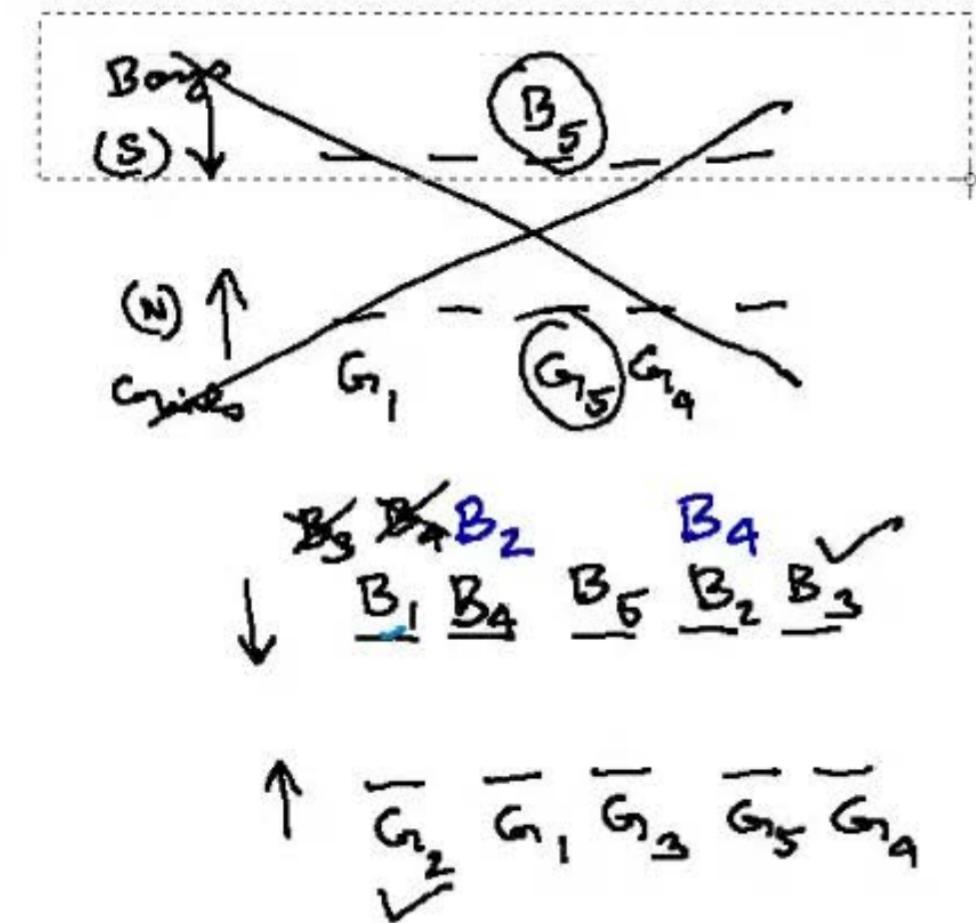
Five girls ( $G_1$ ,  $G_2$ ,  $G_3$ ,  $G_4$  and  $G_5$ ) sit in one row facing north and five boys ( $B_1$ ,  $B_2$ ,  $B_3$ ,  $B_4$  and  $B_5$ ) sit in another row facing south not necessarily in the same order. Each boy is facing a girl.

It is also known that:

- (i)  $G_1$  and  $B_5$  sit opposite each other.
- (ii) Neither  $B_3$  nor  $B_4$  sits opposite  $G_2$ .
- (iii)  $G_5$  sits second to the right of  $G_1$  and to the immediate left of  $G_4$ .
- (iv)  $B_5$  sits exactly in the middle of the row.
- (v)  $B_2$  sits between  $B_1$  and  $B_3$ .

- Which of the following pairs sit at the ends?
- (A)  $B_3$  and  $G_5$
- (B)  $B_4$  and  $G_4$
- (C)  $B_1$  and  $G_1$
- (D)  $B_1$  and  $G_2$

- Who sits opposite  $G_1$ ?  
(A)  $B_1$       (B)  $B_2$        (C)  $B_3$       (D)  $B_4$
- If  $B_4$  and  $B_2$  interchange their positions, then who sits opposite  $B_2$ ?  
(A)  $G_1$       (B)  $G_2$       (C)  $G_3$       (D)  $G_4$



- Six persons – P, Q, R, S, T and U – sit around a circular table, facing the centre, but not necessarily in that order. Q sits to the immediate left of R, who is opposite T. U sits second to the left of P. Who sits opposite S?  
 (A) Q      (B) P      (C) U      (D) P or Q
  - Eight persons – A, B, C, D, E, F, G, and H – sit around a circular table, facing the centre but not necessarily in that order. D sits second to the right of C, who sits opposite B. G is adjacent to F and B. A is neither adjacent to C nor opposite E. Who sits second to the right of G?  
 (A) A      (B) F      (C) H      (D) D
  - Eight persons S, T, U, V, W, X, Y and Z sit around a circular table, facing the centre, but not necessarily in that order. T sits two places away from X. Y sits three places away from U. V sits to the immediate right of Y. S sits opposite Z. Neither T nor X is adjacent to either V or Y. Who sits to the immediate right of V?  
 (A) S      (B) W  
 (C) Z      (D) Cannot be determined

(A) P  
(C) Q

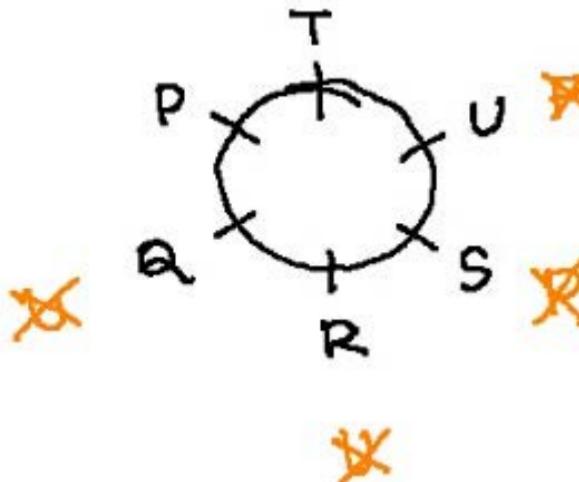
(D) Cannot be determined

- ✓ Six persons – P, Q, R, S, T and U – sit around a circular table, facing the centre, but not necessarily in that order. Q sits to the immediate left of R, who is opposite T. U sits second to the left of P. Who sits opposite S?
- (A) Q      (B) P      (C) U      (D) P or Q

- ✓ Eight persons – A, B, C, D, E, F, G, and H – sit around a circular table, facing the centre but not necessarily in that order. D sits second to the right of C, who sits opposite B. G is adjacent to F and B. A is neither adjacent to C nor opposite E. Who sits second to the right of G?
- (A) A      (B) F      (C) H      (D) D

- ✓ Eight persons S, T, U, V, W, X, Y and Z sit around a circular table, facing the centre, but not necessarily in that order. T sits two places away from X. Y sits three places away from U. V sits to the immediate right of Y. S sits opposite Z. Neither T nor X is adjacent to either V or Y. Who sits to the immediate right of V?
- (A) S      (B) W  
(C) Z      (D) Cannot be determined

- Seven persons – P, Q, R, S, T, U and V – are sitting around a circular table facing the centre, but not necessarily in the same order. The following information is known about them.



(A) P

(C) Q

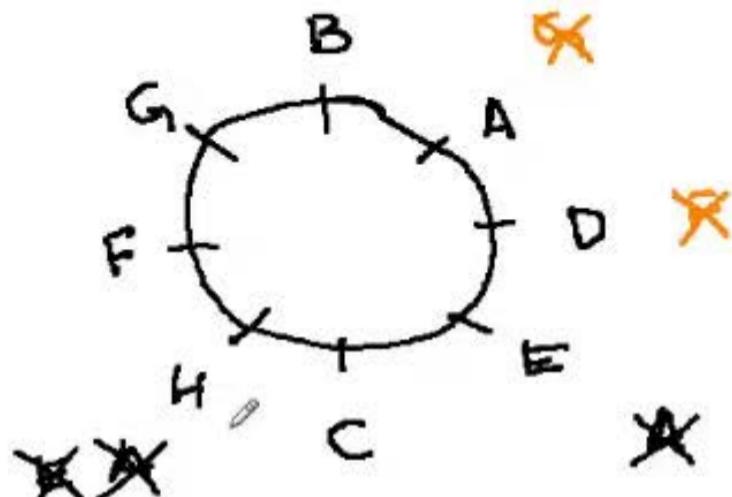
(B) R

(D) Cannot be determined

- ✓ Six persons – P, Q, R, S, T and U – sit around a circular table, facing the centre, but not necessarily in that order. Q sits to the immediate left of R, who is opposite T. U sits second to the left of P. Who sits opposite S?
- (A) Q      (B) P      (C) U      (D) P or Q

- ✓ Eight persons – A, B, C, D, E, F, G, and H – sit around a circular table, facing the centre but not necessarily in that order. D sits second to the right of C, who sits opposite B. G is adjacent to F and B. A is neither adjacent to C nor opposite E. Who sits second to the right of G?
- (A) A      (B) F      (C) H      (D) D

- ✓ Eight persons S, T, U, V, W, X, Y and Z sit around a circular table, facing the centre, but not necessarily in that order. T sits two places away from X. Y sits three places away from U. V sits to the immediate right of Y. S sits opposite Z. Neither T nor X is adjacent to either V or Y. Who sits to the immediate right of V?
- (A) S      (B) W  
(C) Z      (D) Cannot be determined



~~B G F~~

- Seven persons – P, Q, R, S, T, U and V – are sitting around a circular table, facing the centre, but not necessarily in the same order. The following information

(C) Q

(D) Cannot be determined

- ✓ Six persons – P, Q, R, S, T and U – sit around a circular table, facing the centre, but not necessarily in that order. Q sits to the immediate left of R, who is opposite T. U sits second to the left of P. Who sits opposite S?

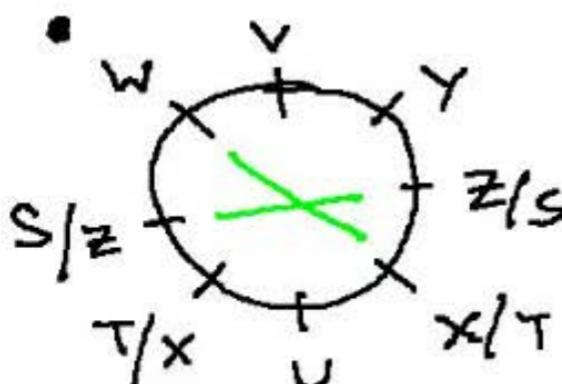
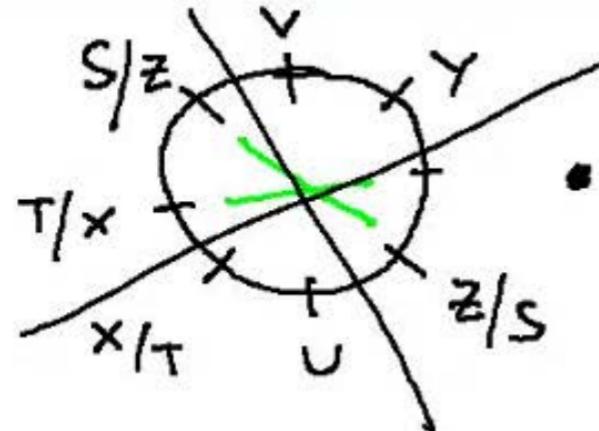
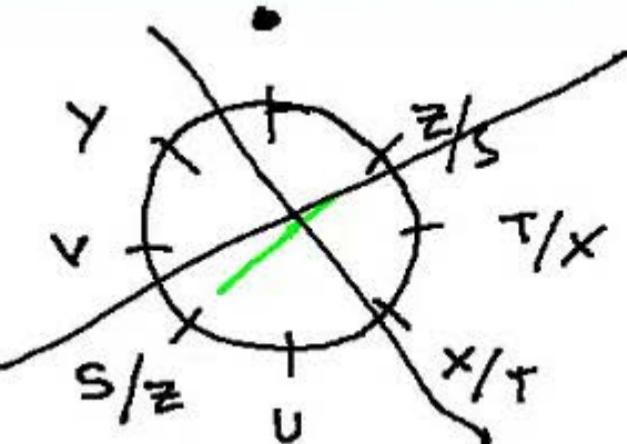
(A) Q      (B) P      (C) U      (D) P or Q

- ✓ Eight persons – A, B, C, D, E, F, G, and H – sit around a circular table, facing the centre but not necessarily in that order. D sits second to the right of C, who sits opposite B. G is adjacent to F and B. A is neither adjacent to C nor opposite E. Who sits second to the right of G?

(A) A      (B) F      (C) H      (D) D

- ✓ Eight persons S, T, U, V, W, X, Y and Z sit around a circular table, facing the centre, but not necessarily in that order. T sits two places away from X. Y sits three places away from U. V sits to the immediate right of Y. S sits opposite Z. Neither T nor X is adjacent to either V or Y. Who sits to the immediate right of V?

(A) S      ✓ (B) W  
(C) Z      (D) Cannot be determined



- ✓ Seven persons – P, Q, R, S, T, U and V – are sitting around a circular table facing the centre, but not necessarily in the same order. The following information is known about them.

✓ • Six persons – P, Q, R, S, T and U are sitting around a circular table facing the centre but not necessarily in the same order.

- (i) Q is adjacent to either T or U but not both.
- (ii) U is second to the left of P, who is opposite Q.
- (iii) T and U are not adjacent to each other.

• Who is to the immediate left of U?

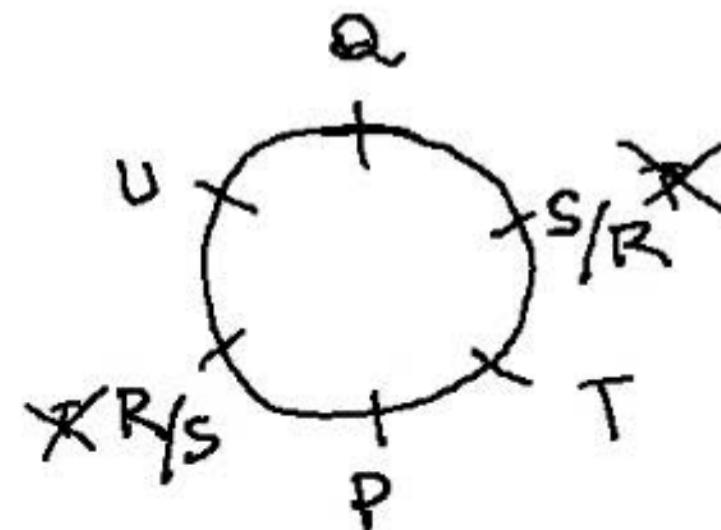
- (A) P
- (B) S
- (C) R
- (D) Q

• Who is sitting two places away to the right of P?

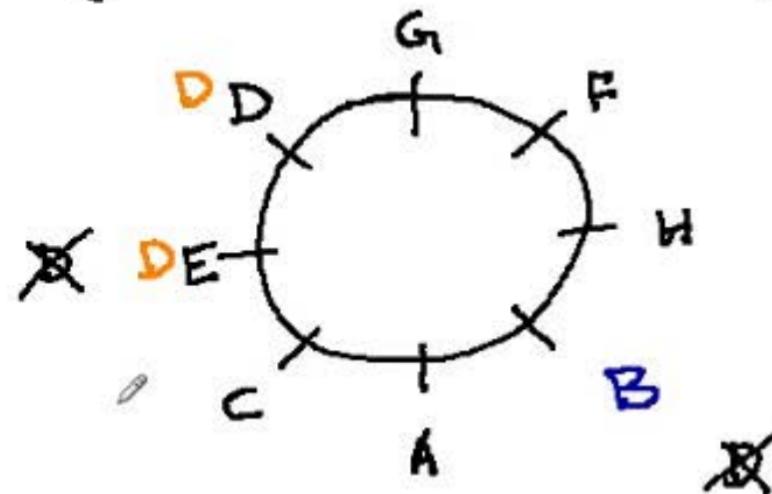
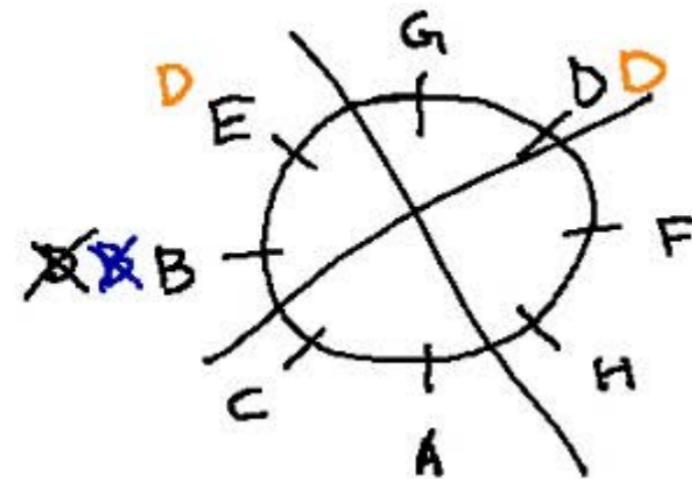
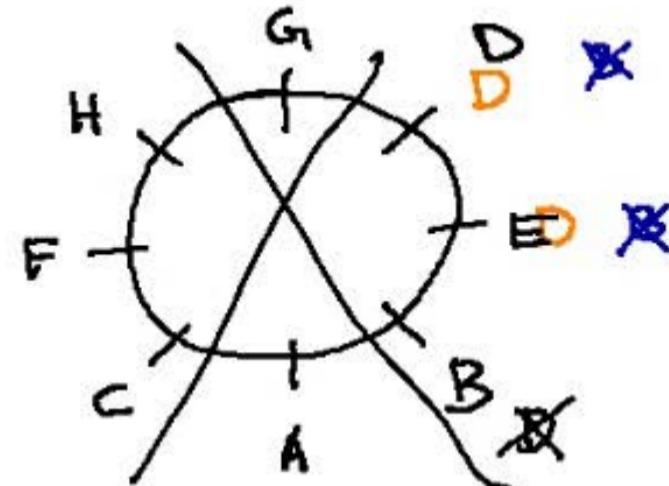
- (A) R
- (B) Q
- (C) U
- (D) Cannot be determined

• Who is sitting opposite T?

- (A) P
- (B) R
- (C) S
- (D) U



- Eight persons – A, B, C, D, E, F, G and H – sit around a circular table facing the centre, but not necessarily in that order. The following information is known about their seating position.
    - (I) B is adjacent to neither E nor G.
    - (II) Three persons sit between A and G.
    - (III) D is adjacent to neither A nor C.
    - (IV) F is to the immediate right of H.
    - (V) C sits to the immediate left of A.
    - (VI) B is not adjacent to D.
    - Who sits opposite C?
      - (A) H
      - (B) G
      - (C) F
      - (D) Cannot be determined
    - Who sits second to the right of E?
      - (A) A
      - (B) G
      - (C) B
      - (D) F
    - Which of the following pairs of persons sit adjacent to G?
      - (A) D, E
      - (B) F, H
      - (C) D, F
      - (D) E, F



3)

Lx :-

The number of ways I can LINEARLY arrange x DISTINCT items is symbolically expressed as x!

I

3)  $x$  :-

The number of ways I can LINEARLY arrange x DISTINCT items is symbolically expressed as  $x!$

$$\begin{matrix} A & B \\ B & A \end{matrix} \} \boxed{2 = 2}$$

$$\begin{matrix} A & B & C \\ A & C & B \\ B & A & C \\ B & C & A \\ C & A & B \\ C & B & A \end{matrix} \} \boxed{6 = 6}$$

$nC_r$

The number of ways I can select  $r$  distinct items from an option of  $n$  distinct items is symbolically expressed as  $nCr$

A B C

$$3C_2 = 3$$

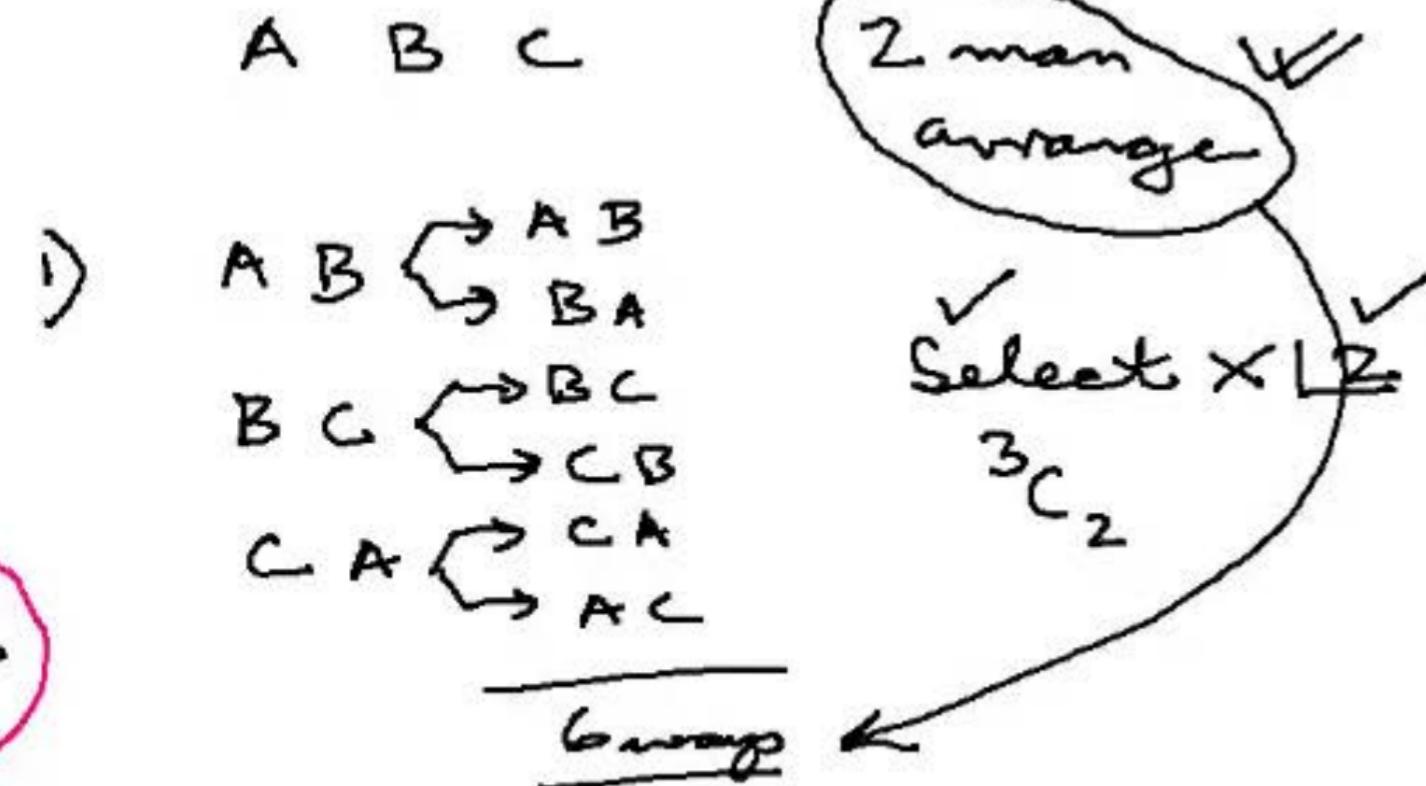
2 ways

- 1) A B
- 2) B C
- 3) C A

The number of ways I can LINEARLY arrange x DISTINCT items is symbolically expressed as  $x!$

The number of ways I can ARRANGE r items out of an option of n DISTINCT items is symbolically expressed as  $nPr$

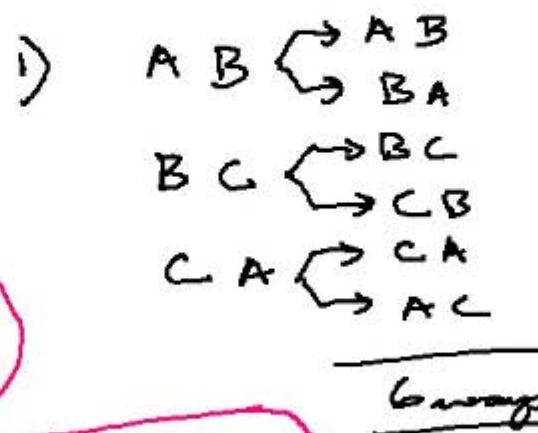
$$3P_2 = {}^3C_2 \times 12$$





The number of ways I can LINEARLY arrange x DISTINCT items is symbolically expressed as  $x!$

A B C



2 man  
arrange

✓ Select x 12  
 ${}^3C_2$

$$3P_2 = {}^3C_2 \times 12$$

$$nP_r = {}^nC_r \times 1r$$

$$\sqrt{10} = 1$$

$${}^7C_5 =$$

① 5, 7



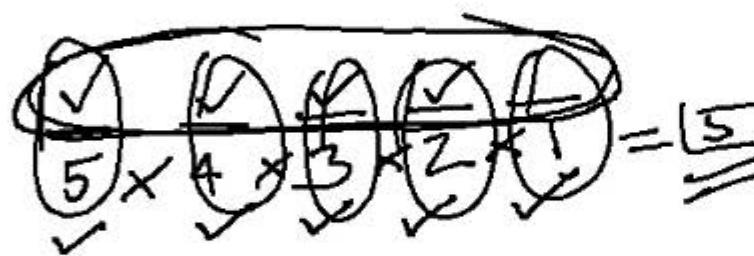
$${}^mC_n = {}^nC_{m-n}$$

②  
 ${}^3C_2$

$$\begin{array}{lll} A & B & C \\ \nearrow A & \nearrow A & \nearrow A \\ 1) AB & 2) AC & 3) BC \\ \searrow B & \searrow B & \searrow C \\ 1) & 2) & 3) \end{array}$$

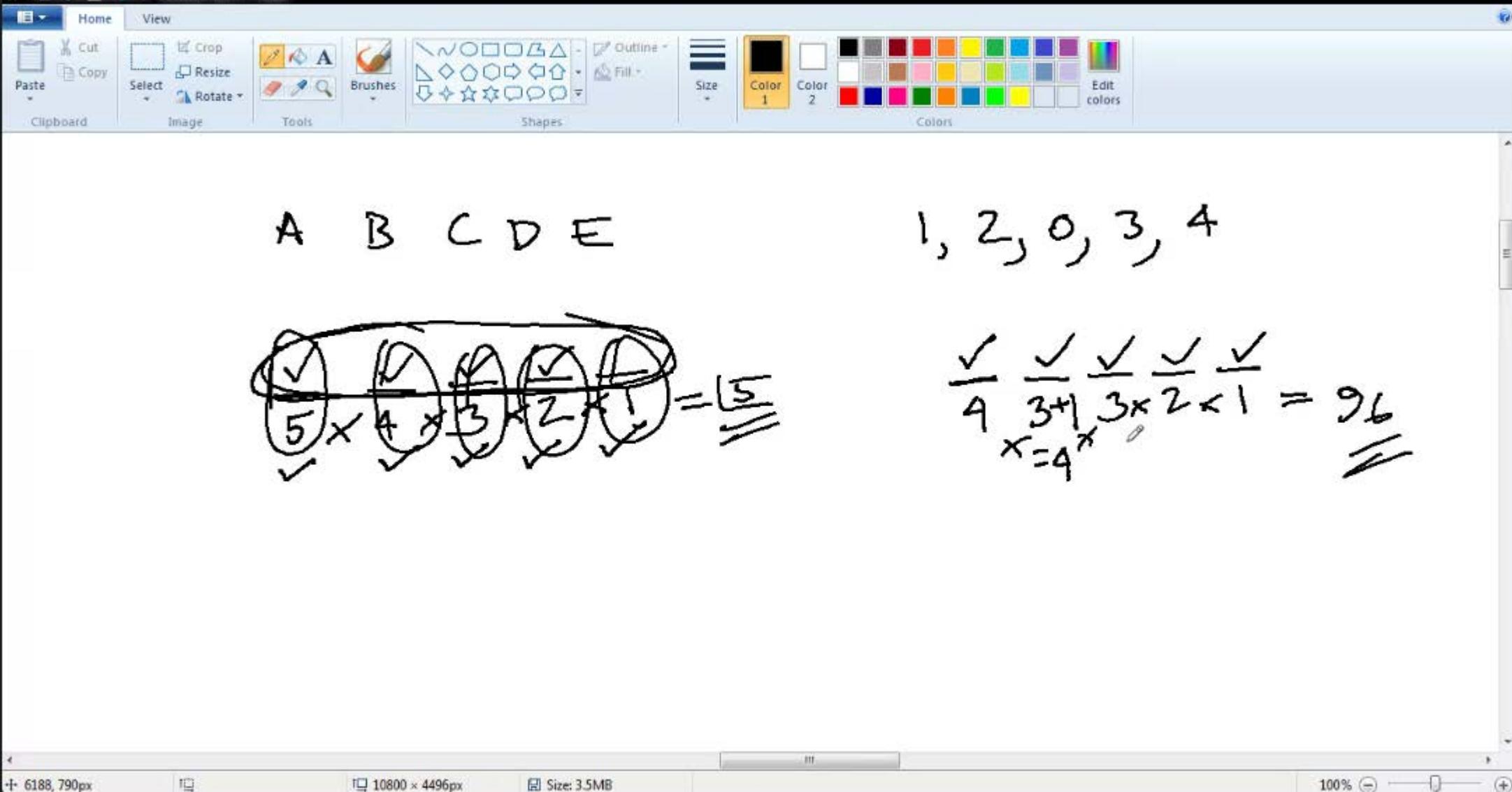
$$\begin{aligned} {}^3C_2 &= {}^3C_1 \\ {}^3C_2 &= {}^3C_3 = {}^3C_1 \end{aligned}$$

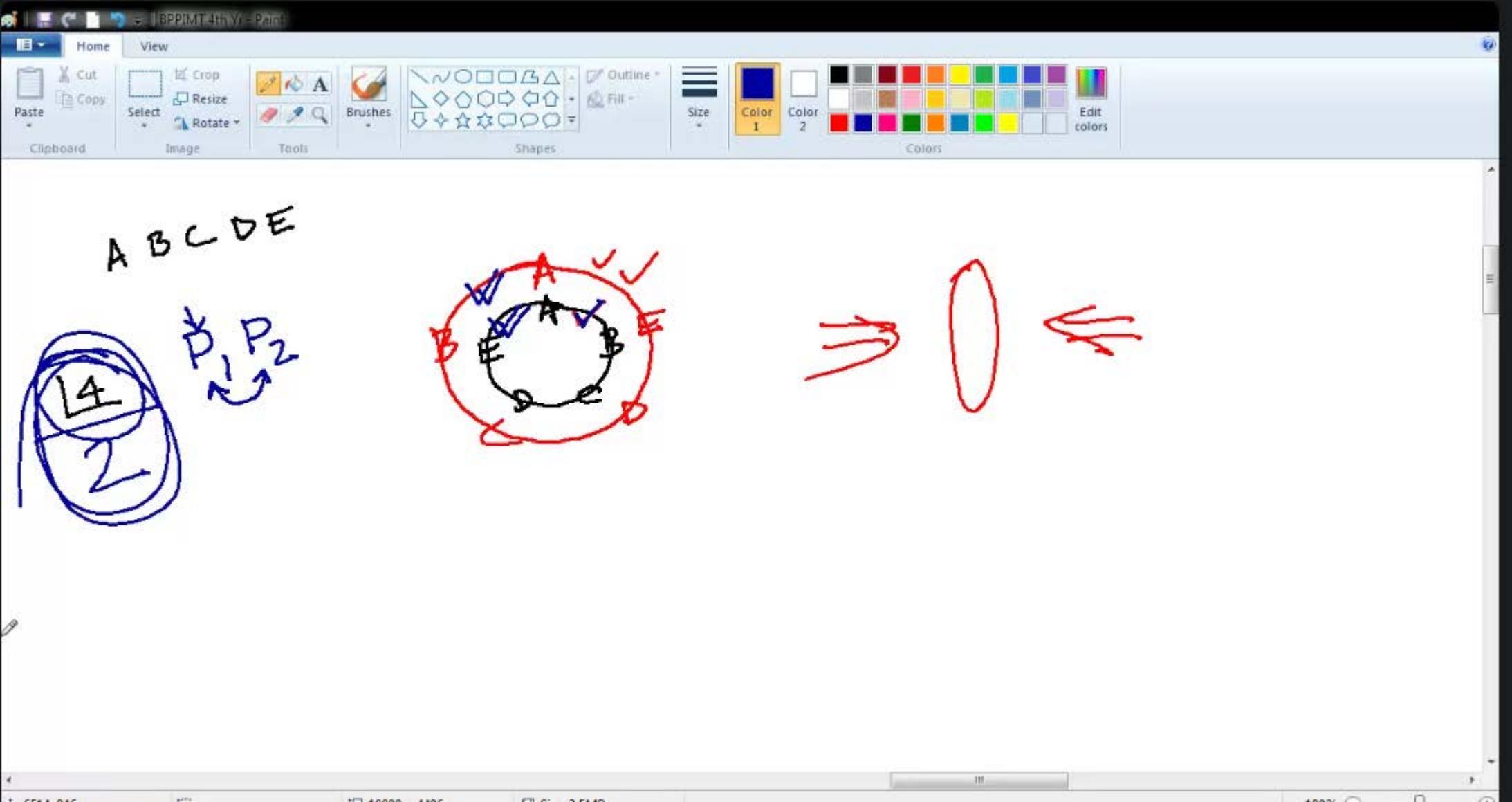
A B C D E



1, 2, 0, 3, 4

$$\frac{\checkmark}{9} \times \frac{\checkmark}{3+1} \times \frac{\checkmark}{3 \times 2 < 1} = \underline{\underline{96}}$$





A B C D E

- - - - -

7ch

(7C<sub>5</sub> × 15)

~~7C<sub>5</sub> × 15~~

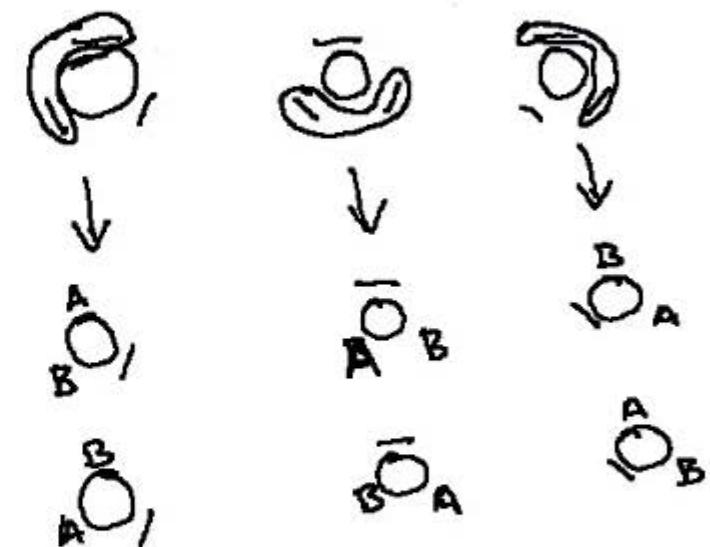


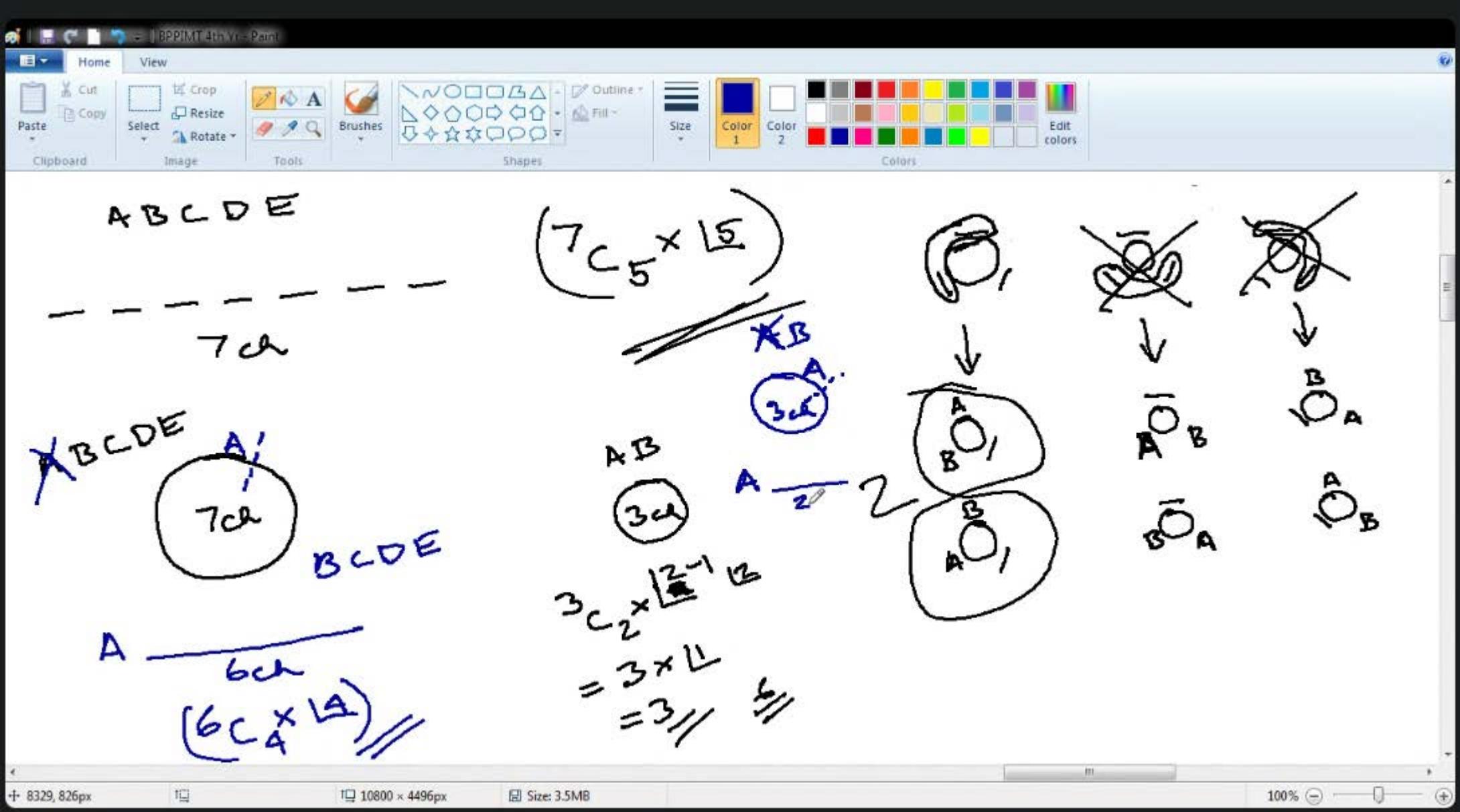
A B C D E  
---  
7ch

A B C D E  
7ch

$(7c_5 \times 15)$

$$\begin{aligned} &AB \\ &\text{3ch} \\ &3c_2 \times 1^2 - 1 \\ &= 3 \times 1 \\ &= 3 \end{aligned}$$

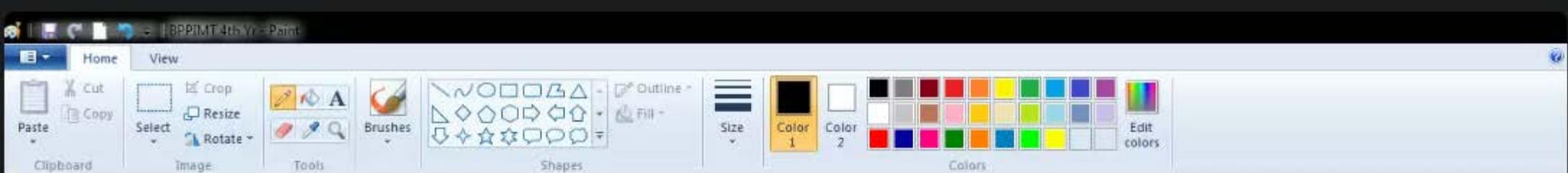






$A B C D E$   
 - - - - -  
 $7ch$   
 ~~$X B C D E$~~   
 $A'$   
 $7ch$   
 $B C D E$   
 $A$  —————  $6ch$   
 $(6C_4 \times 1^A) //$

$(7C_5 \times 1^E)$   
 ~~$\times B$~~   
 $3C_2 \times 1^{2-1} \Rightarrow 2C_1 \times 1^1$   
 $= 3 \times 1^1 \quad \approx \quad = 2 \times 1$   
 $= 3// \quad \approx \quad = 2ways$



1)

Entry →

Exit  
2 gates  
1 2

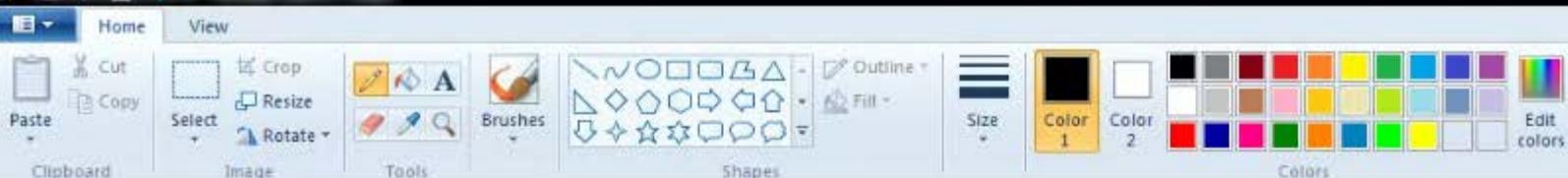
A B C

A1	B1	C1
A2	B2	C2

a) Enter the c. hall  $\rightarrow$  ~~365~~b) Exit the c. hall  $\rightarrow$  ~~228~~SIMULTANEOUSLYc) Enter & Exit --- ?  $\rightarrow$   $(x \times y)$  waysAnalytical  $\rightarrow (365 \times 226)$ Rule of Multiplication



- 1) 5 digits : 0, 2, 3, 5, 8. Repetition not allowed. Find
  - a) How many 5 digit nos ?
  - b) How many 4 digit nos ?
  - c) How many even 5 digit nos ?
  - d) How many 5 digit nos div by 4 ?
  - e) How many 5 digit nos have 2 & 8 together ?
  - f) How many 5 digit nos will have 2 before 8 ?
  - g) How many 4 digit nos if repetition allowed ?
  
- 2) 5 people A, B, C, D, E.
  - a) In how many arrangements will A be before B ?
  - b) A before B and C before D ?
  
- 3) Word :- ANALYSIS.
  - a) How many 8 lettered words can be formed ?
  - b) How many 4 lettered words can be formed ?
  
- 4) There are 5 boys and 6 girls. Select a team of 5 members such that
  - a) At least 1 girl is present ?
  - b) A particular girl is always present ?
  - c) A particular boy is always absent ?



- 1) 5 digits : 0, 2, 3, 5, 8. Repitition not allowed. Find

- How many 5 digit nos ?
- How many 4 digit nos ?
- How many even 5 digit nos ?
- How many 5 digit nos div by 4 ?
- How many 5 digit nos have 2 & 8 together ?
- How many 5 digit nos will have 2 before 8 ?
- How many 4 digit nos if repetition allowed ?

0 2 3 5 8

$$\begin{array}{r} \overline{4} \quad \overline{3+1} \quad \overline{3} \quad \overline{2} \quad \overline{1} \\ = 96 \end{array}$$

2 0 3 5 8

- 2) 5 people A, B, C, D, E.

- In how many arrangements will A be before B ?
- A before B and C before D ?

$$\begin{array}{r} \overline{4} \quad \overline{3+1} \quad \overline{3} \quad \overline{2} \\ = 96 \end{array}$$

- 3) Word :- ANALYSIS.

- How many 8 lettered words can be formed ?
- How many 4 lettered words can be formed ?

0 — — —

- 4) There are 5 boys and 6 girls. Select a team of 5 members such that

- At least 1 girl is present ?
- A particular girl is always present ?
- A particular boy is always absent ?



0 2 3 5 8

- 1) 5 digits : 0, 2, 3, 5, 8. Repetition not allowed. Find
  - a) How many 5 digit nos ?
  - b) How many 4 digit nos ?
  - c) How many even 5 digit nos ?
  - d) How many 5 digit nos div by 4 ?
  - e) How many 5 digit nos have 2 & 8 together ?
  - f) How many 5 digit nos will have 2 before 8 ?
  - g) How many 4 digit nos if repetition allowed ?
  
- 2) 5 people A, B, C, D, E.
  - a) In how many arrangements will A be before B ?
  - b) A before B and C before D ?
  
- 3) Word :- ANALYSIS.
  - a) How many 8 lettered words can be formed ?
  - b) How many 4 lettered words can be formed ?
  
- 4) There are 5 boys and 6 girls. Select a team of 5 members such that
  - a) At least 1 girl is present ?
  - b) A particular girl is always present ?
  - c) A particular boy is always absent ?

$$\begin{array}{l}
 1) \quad \overline{4} \ \overline{3} \ \overline{2} \ \overline{1} \ \textcircled{0} = 24 \\
 2) \quad \overline{3} \ \overline{2} \ \overline{1} \ \overline{2} \ \textcircled{1} = 18 \\
 3) \quad \overline{3} \ \overline{2} \ \overline{1} \ \overline{8} = 18 \\
 \hline
 & \quad \overline{\overline{66}} \checkmark
 \end{array}$$



0 2 3 5 8

08      28  
20      32  
80      52

$$\frac{1}{3} \frac{-}{2} \frac{-}{1} 08 = 6 \times 3$$

$$\frac{1}{2} \frac{-}{2} \frac{-}{1} 28 = 4 \times 3$$

✓ 30

- 1) 5 digits : 0, 2, 3, 5, 8. Repetition not allowed. Find
  - a) How many 5 digit nos ?
  - b) How many 4 digit nos ?
  - c) How many even 5 digit nos ?
  - d) How many 5 digit nos div by 4 ?
  - e) How many 5 digit nos have 2 & 8 together ?
  - f) How many 5 digit nos will have 2 before 8 ?
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- 2) 5 people A, B, C, D, E.
  - a) In how many arrangements will A be before B ?
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- 3) Word :- ANALYSIS.
  - a) How many 8 lettered words can be formed ?
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- 4) There are 5 boys and 6 girls. Select a team of 5 members such that
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- 1) 5 digits : 0, 2, 3, 5, 8. Repetition not allowed. Find
  - a) How many 5 digit nos ?
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  - d) How many 5 digit nos div by 4 ?
  - e) How many 5 digit nos have 2 & 8 together ?
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- 4) There are 5 boys and 6 girls. Select a team of 5 members such that
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  - c) A particular boy is always absent ?

0 3 5 2 8 → 12

$$3 \times 3 \times 2 \times 1 = 18 \times 12$$

= 36 ways

0 2 3 5 8

C  $\leftarrow$  B

0

$$\frac{2}{1} \quad \frac{1}{4} \quad \frac{1}{3} \quad \frac{1}{2} \quad \frac{1}{1} = 24$$

$$\cancel{\frac{2}{2}} \quad \frac{2}{1} \quad \frac{1}{3} \quad \frac{1}{2} \quad \frac{1}{1} = 12$$

$$\cancel{\frac{2}{2}} \quad \cancel{\frac{2}{2}} \quad \frac{2}{1} \quad \frac{1}{2} \quad \frac{1}{1} = 8$$

$$\cancel{\frac{2}{2}} \quad \cancel{\frac{2}{2}} \quad \cancel{\frac{2}{1}} \quad \frac{2}{1} \quad \frac{1}{1} = 4$$

48

A B C X

A C B ✓

B A C ✗

B C A ✗

C A B ✓

C B A ✓

3

- 5) a) 5 boys and 5 girls sit alternately  
What if they sat in a circular fashion  
c) If there are 5 consonants and 3 v-

- 6) 13 friends decided to have their lun  
There are two entry doors to the re  
equidistant and equally accessible  
proceeded together to their tables.  
a) c-t had 7 chairs and o-t 6,  
b) c-t had 9 chairs and o-t also 9,  
c) c-t had 17 chairs and o-t also 17,  
and the friends proceed to the next

- 7) There is a  $6 \times 6$  chess board. In ho  
such that the black square does not

- 8) Ram typed a 6-digit no into a faulty  
on the screen was 2003, possibly w  
have Ram typed ?



0 2 3 5 8

C ← B

x A B C X

B ← A

x A C B ✓

1)  $\frac{2}{1} \frac{2}{4} \frac{3}{3} \frac{1}{2} \frac{1}{1} = 24$

✓ B A C X

2)  $\cancel{\cancel{2}} \frac{2}{2} \frac{3}{3} \frac{1}{2} \frac{1}{1} = 12$

✓ B C A X

3)  $\cancel{\cancel{2}} \cancel{\cancel{2}} \frac{2}{2} \frac{1}{2} \frac{1}{1} = 8$

X C A B ✓

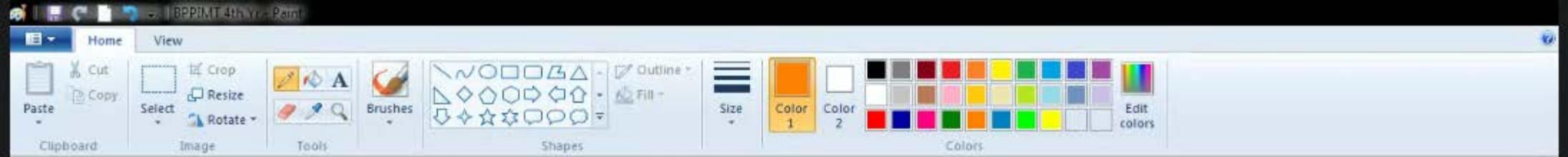
4)  $\cancel{\cancel{2}} \cancel{\cancel{2}} \cancel{\cancel{1}} \frac{2}{1} \frac{1}{1} = 4$

✓ C B A ✓

48

- 5) a) 5 boys and 5 girls  
What if they sat in a  
c) If there are 5 conse
- 6) 13 friends decided to  
There are two entry te  
equidistant and equa  
proceeded together i  
a) c-t had 7 chairs an  
b) c-t had 9 chairs an  
c) c-t had 17 chairs ar  
and the friends proce
- 7) There is a  $6 \times 6$  ches  
such that the black sc
- 8) Ram typed a 6-digit r  
on the screen was 21  
have Ram typed ?

mbers such that



98 48

0 2 3 5 8

C ← B

x A B C x

$$1) \frac{2}{1} \frac{4}{4} \frac{3}{3} \frac{2}{2} \frac{1}{1} = 24$$

B ← A

x A C B ✓

$$3) \cancel{\frac{2}{2}} \frac{2}{1} \frac{3}{3} \frac{2}{2} \frac{1}{1} = 12$$

✓ B A C x

$$\cancel{3} \cancel{\frac{2}{2}} \cancel{\frac{2}{2}} \frac{2}{1} \frac{2}{2} \frac{1}{1} = 8$$

x C A B ✓

$$4) \cancel{\frac{2}{2}} \cancel{\frac{2}{2}} \cancel{\frac{2}{2}} \frac{2}{1} \frac{2}{1} \frac{1}{1} = 4$$

✓ C B A ✓  
3                   3

numbers such that

- 5) a) 5 boys and 5 girls  
What if they sat in a c  
c) If there are 5 conse
- 6) 13 friends decided to  
There are two entry c  
equidistant and equal  
proceeded together i  
a) c-t had 7 chairs an  
b) c-t had 9 chairs an  
c) c-t had 17 chairs ar  
and the friends proce
- 7) There is a  $6 \times 6$  ches  
such that the black sc
- 8) Ram typed a 6-digit r  
on the screen was 21  
have Ram typed ?



98 48  
 0 2 3 5 8

$\frac{2}{4} + \frac{3}{3} - \frac{2}{2} = 9L$

1)  $\frac{2}{4} + \frac{3}{3} - \frac{2}{2} = 24$   
 2)  $\frac{2}{2} + \frac{3}{3} - \frac{2}{2} = 12$   
 3)  $\frac{2}{2} + \frac{2}{2} - \frac{2}{2} = 8$   
 4)  $\frac{2}{2} + \frac{2}{2} - \frac{2}{1} = 4$

$\frac{48}{48}$

C  $\leftarrow$  B      A      B      C      X

B  $\leftarrow$  A      A      C      B      ✓

✓ B      A      C      X

✓ B      C      A      X

✗ C      A      B      ✓

✓ C      B      A      ✓

$\frac{3}{3}$       \*       $\frac{3}{3}$

- 5) a) 5 boys and 5 girls  
What if they sat in a circle?  
c) If there are 5 consecutive numbers such that
- 6) 13 friends decided to go for a walk.  
There are two entry doors. The doors are equidistant and equally spaced. The friends proceeded together in a clockwise direction.  
a) c-t had 7 chairs and the friends proceeded together in a clockwise direction.  
b) c-t had 9 chairs and the friends proceeded together in a clockwise direction.  
c) c-t had 17 chairs and the friends proceeded together in a clockwise direction.
- 7) There is a  $6 \times 6$  chess board. There are 32 pieces on the board such that the black squares have 1 piece and the white squares have 2 pieces.  
such that the black squares have 1 piece and the white squares have 2 pieces.
- 8) Ram typed a 6-digit number on the screen. The sum of the digits was 21. How many digits did Ram type?



- 2) 5 people A, B, C, D, E.
  - a) In how many arrangements will A be before B ?
  - b) A before B and C before D ?
- 3) Word :- ANALYSIS.
  - a) How many 8 lettered words can be formed ?
  - b) How many 4 lettered words can be formed ?
- 4) There are 5 boys and 6 girls. Select a team of 5 members such that
  - a) At least 1 girl is present ?
  - b) A particular girl is always present ?
  - c) A particular boy is always absent ?
  
- 9) Suppose n is an integer such that the sum of the digits of n is 2 and  $10^{10} < n < 10^{11}$ , then how many values of n can be found ?
- 10) X girls stand at distinct equidistant points on the circumference of a circle. Each possible pair of girls not standing next to each other sings a 2 min song, one after the other. If the total time taken for singing is 28 mins, find the value of X ?
- 11) There is a  $7 \times 6$  grid with equal horizontal & vertical spacing between the grid lines, with some dots present as shown



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{

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- a) How many 8 lettered words can be formed ?
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$$\frac{A \leftarrow B}{C \leftarrow D} \rightarrow 60$$

$$\frac{C \leftarrow D}{D \leftarrow C} \rightarrow \underline{\underline{30}}$$

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- 11) There is a  $7 \times 6$  grid with equal horizontal & vertical spacing between the grid lines, with some dots present as shown

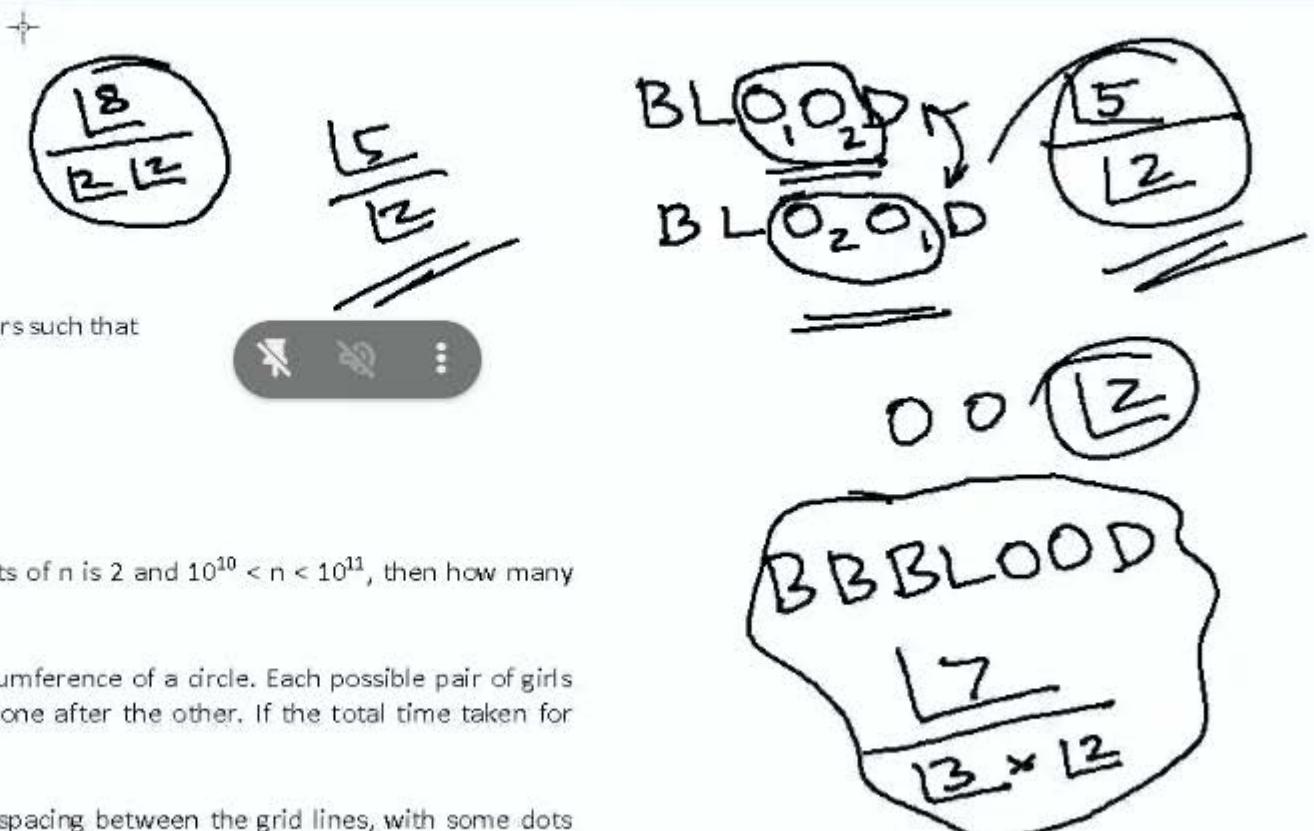


BBBLOOD

$$\frac{1}{7} \\ 3 \times 12$$



- 2) 5 people A, B, C, D, E.
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C, D, E.

How many arrangements will A be before B?

and C before D?

SIS.

3 lettered words can be formed?

4 lettered words can be formed?

ys and 6 girls. Select a team of 5 members such that

1 is present?

girl is always present?

boy is always absent?

n integer such that the sum of the digits of n is 2 and  $10^{10} < n < 10^{11}$ , then how many  
be found?

at distinct equidistant points on the circumference of a circle. Each possible pair of girls  
next to each other sings a 2 min song, one after the other. If the total time taken for  
ins, find the value of X?

6 grid with equal horizontal & vertical spacing between the grid lines, with some dots

$$\text{ANÁLISIS } \rightarrow \text{AASS} : - \left( {}^2C_2 \times \frac{14}{12 \times 12} \right) = 6$$

$$2) \underset{\text{SS}}{\cancel{\text{AA}}} -- : - \left( {}^2C_1 \times {}^5C_2 \times \frac{14}{12} \right) = 240$$

$$3) --- : - \left( {}^2C_0 \times {}^6C_4 \times 14 \right) = \frac{360}{\cancel{14}}$$

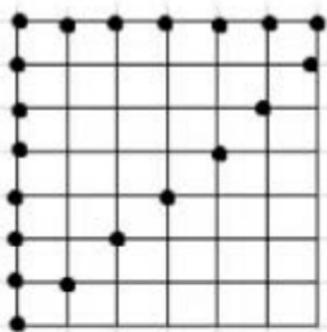
1606

$$1 \cdot {}^6C_2 \cdot \frac{6 \times 5}{2 \times 1} = 15$$

- a) In how many arrangements will A be before B ?  
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- 11) There is a  $7 \times 6$  grid with equal horizontal & vertical spacing between the grid lines, with some dots present as shown



- a) How many straight lines can be drawn using the dots ?
- b) How many triangles can be drawn using the dots ?
- f) How many rectangles can be drawn using the grid lines ?
- g) How many squares can be drawn using the grid lines ?



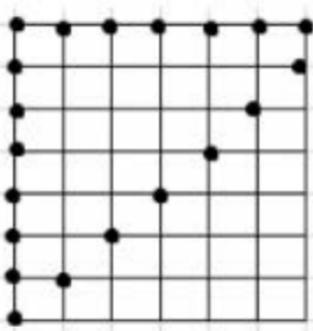
- i) How many 5 digit nos will have 2 before 8 ?
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$$\sum \text{digits} = 2$$

$$10^{10} < n < 10^{11}$$

$$\begin{array}{l} \text{1)} \quad \begin{array}{c} 1 \\ | \\ 1 \\ 0 \\ | \\ 0 \\ 0 \\ | \\ 1 \end{array} \rightarrow 10 \text{ Nos,} \\ + \\ \hline \text{2)} \quad \begin{array}{c} 2 \\ | \\ - \\ - \\ - \end{array} \rightarrow 1 \text{ No} \\ \hline \text{11 Nos,} \end{array}$$

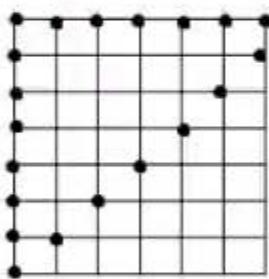
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  - g) How many squares can be drawn using the grid lines ?
  - h) How many perfect rectangles can be drawn using the grid lines ?



- 10) X girls stand at distinct equidistant points on the circumference of a circle. Each possible pair of girls not standing next to each other sings a 2 min song, one after the other. If the total time taken for singing is 28 mins, find the value of X ?
- 11) There is a  $7 \times 6$  grid with equal horizontal & vertical spacing between the grid lines, with some dots present as shown

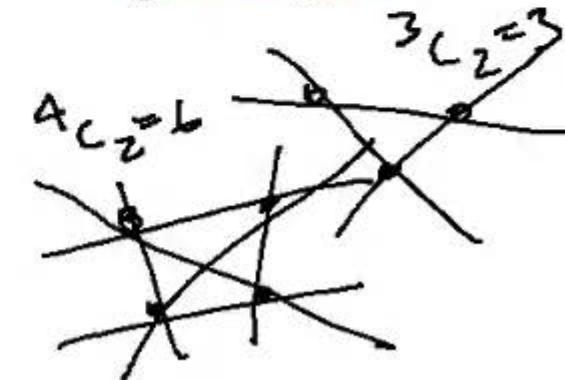
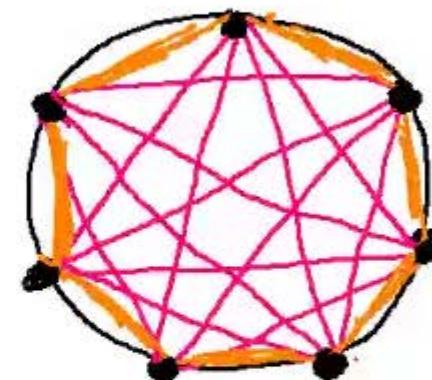


$$\textcircled{X=7}$$

$$\frac{28}{2} = 14 \text{ no. of pairs}$$

$$14 = \binom{X}{2}$$

- How many straight lines can be drawn using the dots ?
- How many triangles can be drawn using the dots ?
- How many rectangles can be drawn using the grid lines ?
- How many squares can be drawn using the grid lines ?
- How many perfect rectangles can be drawn using the grid lines ?



BPPIMT 4th Yr - Paint

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Clipboard Image Shapes

- 10) X girls stand at distinct equidistant points on the circumference of a circle. Each possible pair of girls not standing next to each other sings a 2 min song, one after the other. If the total time taken for singing is 28 mins, find the value of X ?
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$\text{X} = 7$

$\frac{28}{2} = 14 \text{ songs}$

$12C_2 - 12$

$14 = (X C_2 - X)$

$12C_2 - 12$

$3C_2 = 3$

$4C_2 = 6$

10800 x 4496px Size: 3.5MB 100%

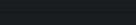
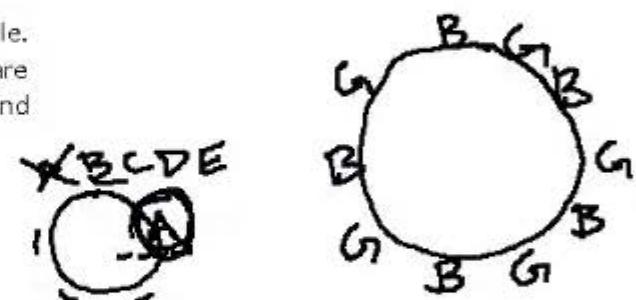
- 5) a) 5 boys and 5 girls sit alternately in a linear fashion. How many such arrangements are possible ? b) What if they sat in a circular fashion ?  
c) If there are 5 consonants and 3 vowels, how many 8 lettered words will have no vowel together ?
- 6) 13 friends decided to have their lunch at a restaurant. They booked an oval-table and a counter-table. There are two entry doors to the restaurant, one on each side of the tables booked. Both the doors are equidistant and equally accessible from the car-park of the restaurant. They met at the car-park and proceeded together to their tables. In how many ways could they have seated themselves if  
a) c-t had 7 chairs and o-t 6,  
b) c-t had 9 chairs and o-t also 9,  
c) c-t had 17 chairs and o-t also 17,  
and the friends proceed to the next table only after the first is filled up.
- 7) There is a  $6 \times 6$  chess board. In how many ways can I select a white square, and then a black square, such that the black square does not lie on the same row and column as that of the white ?
- 8) Ram typed a 6-digit no into a faulty computer in which one of the no key was broken. The no appearing on the screen was 2003, possibly with some blank spaces. How many different 6 digit numbers could have Ram typed ?

- 12) There are 10 questions in an exam, each with two choices.
  - a) In how many ways can I answer the questions ?
  - b) In how many ways can I answer at least one question correctly ?
  
- 13) There are 5 different Physics books, 4 different Chem books and 3 different Maths books. In how many ways can I select
  - a) At least 1 book ?
  - b) At least one book of each type ?



- 5) a) 5 boys and 5 girls sit alternately in a linear fashion. How many such arrangements are possible ? b) What if they sat in a circular fashion ?  
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5g  
5g  
~~5g~~



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b) c-t had 9 chairs and o-t also 9,  
c) c-t had 17 chairs and o-t also 17,  
and the friends proceed to the next table only after the first is filled up.
- 7) There is a  $6 \times 6$  chess board. In how many ways can I select a white square, and then a black square, such that the black square does not lie on the same row and column as that of the white ?
- 8) Ram typed a 6-digit no into a faulty computer in which one of the no key was broken. The no appearing on the screen was 2003, possibly with some blank spaces. How many different 6 digit numbers could have Ram typed ?

5 cons    3 vs

- C - C - C - C - C -

$$\begin{aligned}
 & 120 \times \frac{6 \times 5 \times 4}{12} \times 6 \\
 & 14400 \text{ ways} \\
 & (15 \times 6 \times 3 \times 13)
 \end{aligned}$$



- 5) a) 5 boys and 5 girls sit alternately in a linear fashion. How many such arrangements are possible ? b)  
What if they sat in a circular fashion ?  
c) If there are 5 consonants and 3 vowels, how many 8 lettered words will have no vowel together ?
- 6) 13 friends decided to have their lunch at a restaurant. They booked an oval-table and a counter-table. There are two entry doors to the restaurant, one on each side of the tables booked. Both the doors are equidistant and equally accessible from the car-park of the restaurant. They met at the car-park and proceeded together to their tables. In how many ways could they have seated themselves if  
a) c-t had 7 chairs and o-t 6,  
b) c-t had 9 chairs and o-t also 9,  
c) c-t had 17 chairs and o-t also 17,  
and the friends proceed to the next table only after the first is filled up.
- 7) There is a  $6 \times 6$  chess board. In how many ways can I select a white square, and then a black square, such that the black square does not lie on the same row and column as that of the white ?
- 8) Ram typed a 6-digit no into a faulty computer in which one of the no key was broken. The no appearing on the screen was 2003, possibly with some blank spaces. How many different 6 digit numbers could have Ram typed ?

No Keys  $\rightarrow 10$

Who is kharap  $\rightarrow 10 - 3 = 7$

~~2003~~ 2 times kharap

~~112803~~  
~~xx 2\_0\_0\_3 -~~  
~~662003~~

2\_0\_0x3 -

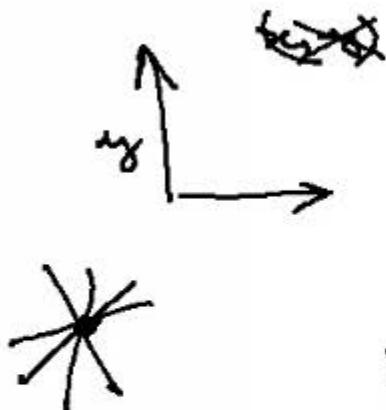
$$7C_1 \times (5C_1 + 5C_2)$$

$$\begin{aligned} &= 7(5+10) \\ &= 105 \text{ ways} \end{aligned}$$

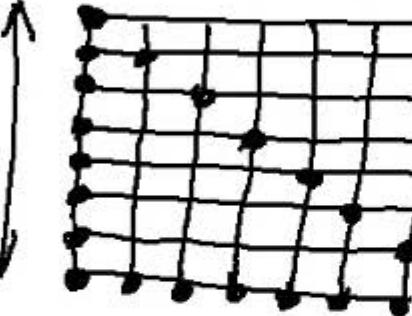


$$(8+7-1) = 14 \div 7 - 1 = 20 \text{ dots}$$

7+1 = 8 showing  
6+1 = 7 went



(7x6) grid



i) Distinguish rt lines using the dots?

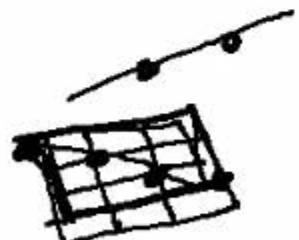
✓  $20c_2 - (8c_2 + 7c_2 + 7c_2)$

+ 1 + 1 + 1

$$= \frac{10}{20 \times 19} \quad \frac{8+7}{12} \quad \frac{7 \times 2}{12}$$

$$190 - (28 + 21 + 21) + 3$$

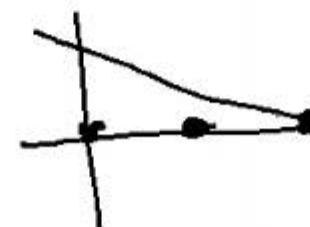
$$= 123$$

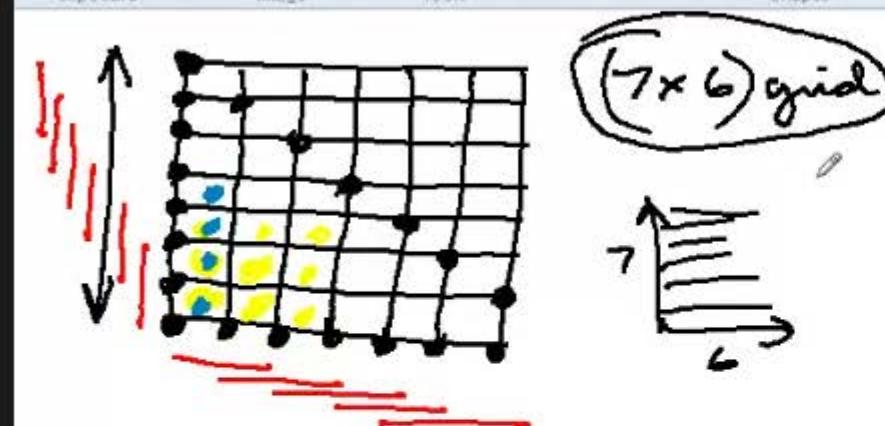


$7+1 = 8$  horiz

$6+1 = 7$  vert

$\checkmark 3c_2$  rt line





$$(1 \times 1) = 6 \times 7 = 42$$

$$(2 \times 2) = 5 \times 6 = 30$$

$$(3 \times 3) = 4 \times 5 = 20$$

$$(4 \times 4) = 3 \times 4 = 12$$

$$(5 \times 5) = 2 \times 3 = 6$$

$$(6 \times 6) = 1 \times 2 = 2$$

$$(7 \times 7) = 0 \times 1 = 0$$

- 1) Using grid lines how many distinct rect?
- 2) Using grid lines how many distinct rqs?
- Horiz  $\rightarrow 7+1=8$  Horiz

Vert  $\rightarrow 6+1=7$  vert

$$\binom{8}{2} \times \binom{7}{2}$$



$$\begin{aligned}(1 \times 1) &= 6 \times 7 = 42 \quad 6^2 \\(2 \times 2) &= 5 \times 6 = 30 \quad 5^2 \\(3 \times 3) &= 4 \times 5 = 20 \quad 4^2 \\(4 \times 4) &= 3 \times 4 = 12 \quad 3^2 \\(5 \times 5) &= 2 \times 3 = 6 \quad 2^2 \\(6 \times 6) &= 1 \times 2 = 2 \quad 1^2 \\(7 \times 7) &= 0 \times 1 = 0\end{aligned}$$

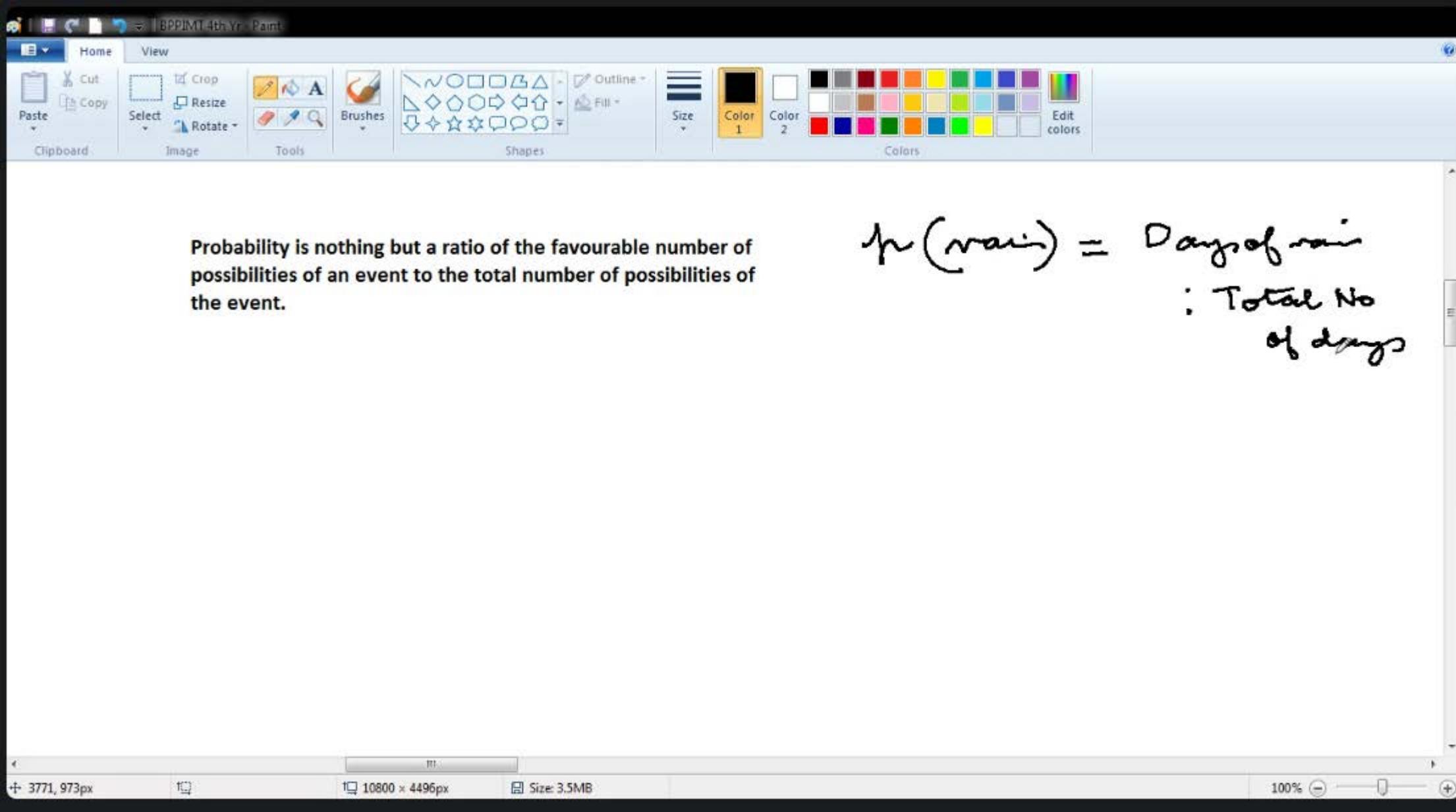
- 1) Using grid lines  
how many distinct rect?
- 2) Using grid lines  
how many distinct sqs?

$$\text{Honey} \rightarrow 7+1=8 \text{ Honey}$$

$$\text{Vert} \rightarrow 6+1=7 \text{ vert distinct proper rect}$$

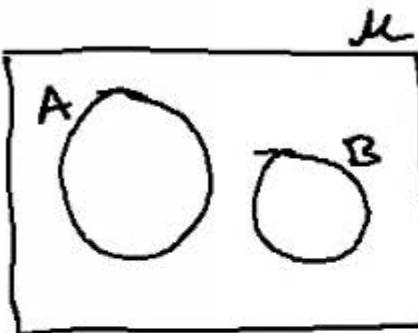
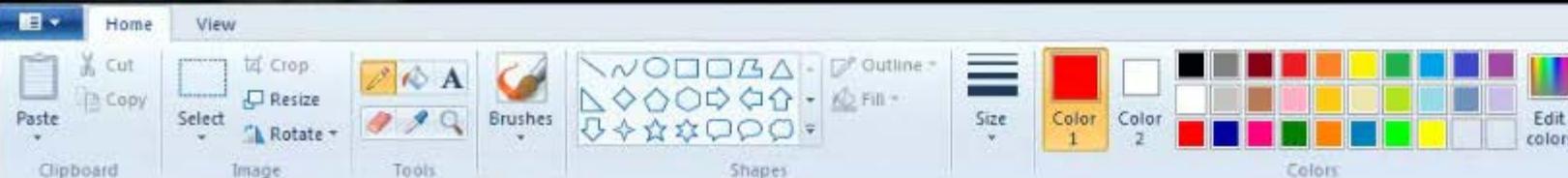
$$\checkmark (8C_2 \times 7C_2) - 112 \quad l \neq b$$

= P. Rect

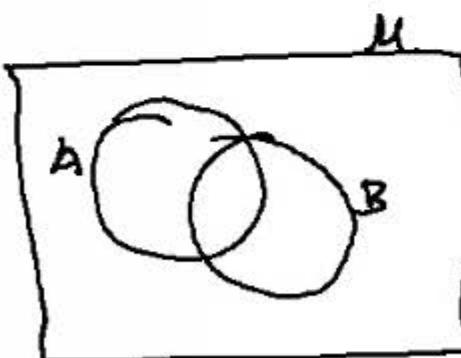


Probability is nothing but a ratio of the favourable number of possibilities of an event to the total number of possibilities of the event.

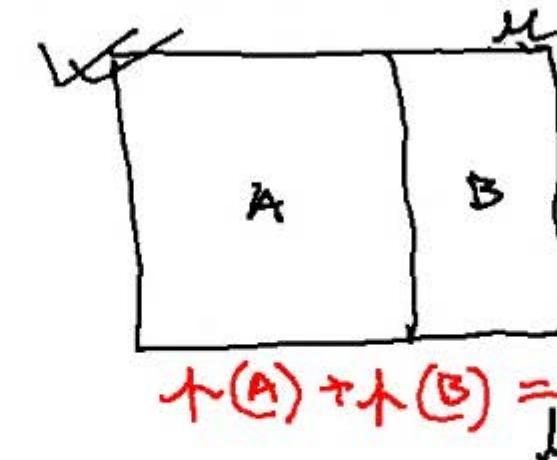
$$P(\text{rain}) = \frac{\text{Days of rain}}{\text{Total No of days}}$$



Not exhaustive  
& mut-exclus



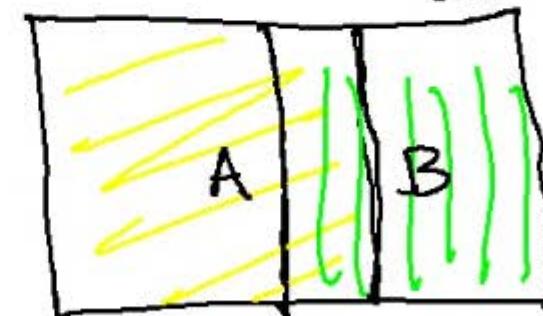
Not exhaust  
& mut-exclus.



$$f(A) + f(B) = f(\mu)$$

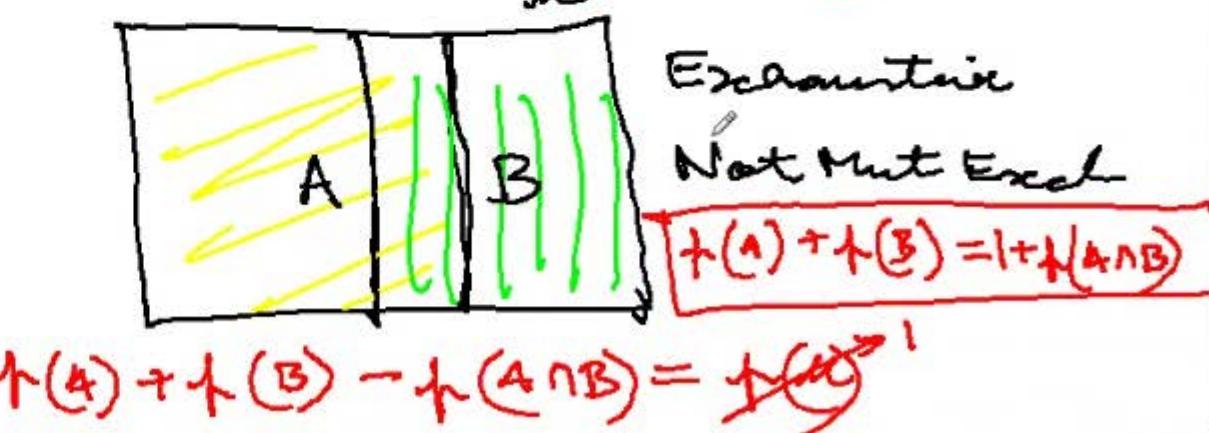
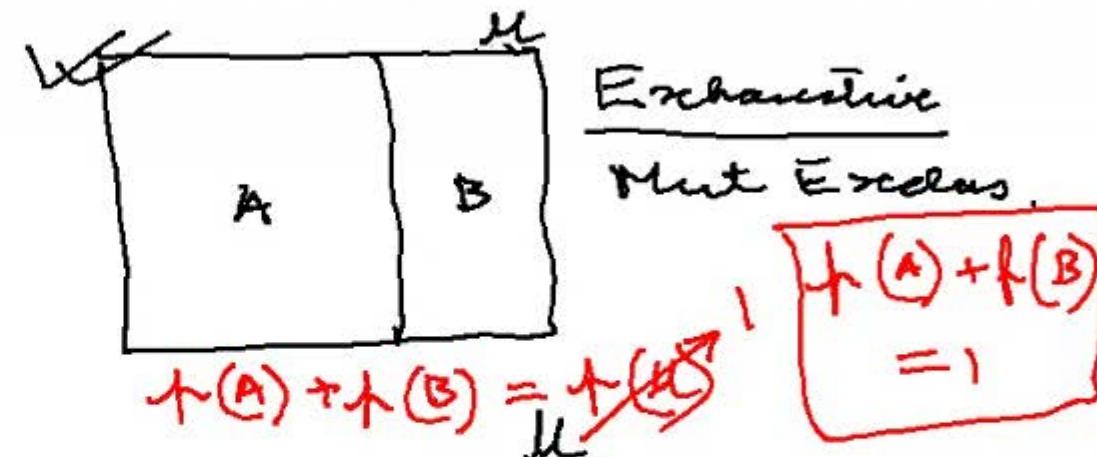
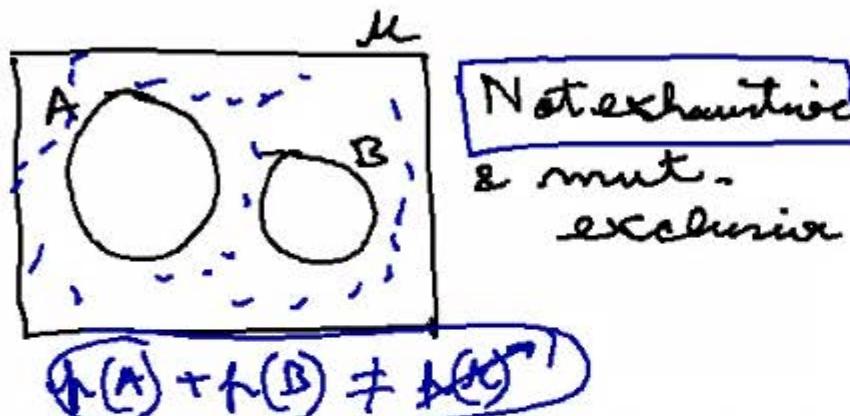
Exhaustive  
Mut Exclus.

$$\boxed{f(A) + f(B) = 1}$$



Exhaustive  
Not Mut Exch

$$f(A) + f(B) - f(A \cap B) = f(\mu)$$





- 1) If 2 dice are thrown simultaneously, what is the probability that
  - a) one shows 2 and the other shows 5 ?
  - b) one shows 6 and the other doesn't show 6 ?
  - c) the sum obtained is less than 9 ?
  
- 2) a) If 5 coins are tossed together, what is the probability of getting exactly 2 heads ?  
b) If 4 coins are tossed together, what is the probability of getting at least 2 tails ?
  
- 3) When 2 cards are drawn simultaneously from a pack of cards, what is the probability that
  - a) one is a diamond and the other black ?
  - b) one is a diamond and the other is a king ?
  
- 4) When 2 cards are drawn one after the other from a pack of cards, without replacing the first one picked up, the what is the probability that
  - a) one is a diamond and the other black ?
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$$\text{TO} = 6 \times 6 = 36$$

✓ ll

$\text{a) FO} = \frac{2}{6} \times \frac{5}{5} = 2$

$$P(?) = \frac{2}{36} = \frac{1}{18}$$

$\text{b) FO} = \frac{1}{6} \times \frac{5}{5} = \frac{1}{6}$

$\frac{1}{6} + \frac{5}{6} = 10$

$$P(?) = \frac{10}{36} = \frac{5}{18}$$

$\text{c) FO for } \geq 9$

$9 \rightarrow \frac{6}{13} / \frac{5}{12} / \frac{4}{9} / \frac{3}{5} / \frac{2}{1}$

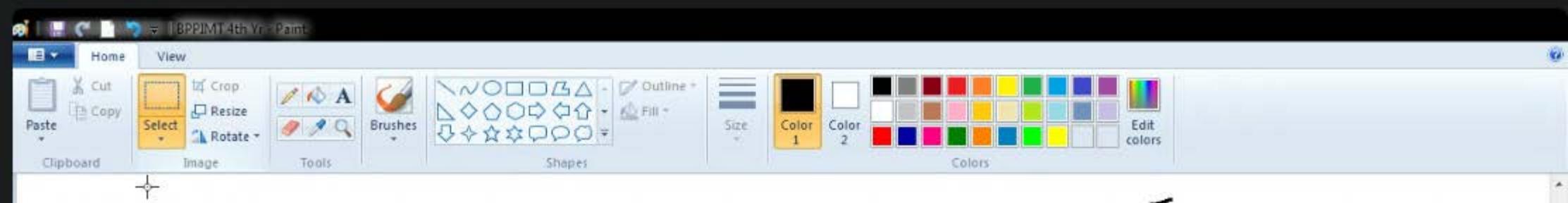
$10 \rightarrow \frac{5}{13} / \frac{4}{12} / \frac{3}{8} / \frac{2}{5} / \frac{1}{3}$

$11 \rightarrow \frac{4}{13} / \frac{3}{12} / \frac{2}{8} / \frac{1}{5} / \frac{0}{2}$

$12 \rightarrow \frac{3}{13} / \frac{2}{12} / \frac{1}{8} / \frac{0}{3} / \frac{0}{1}$

$$P(\geq 9) = \frac{10}{36} = \frac{5}{18}$$

$$P(< 9) = 1 - \frac{5}{18} = \frac{13}{18} //$$



- 1) If 2 dice are thrown simultaneously, what is the probability that
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*at least 2  
✓ x x 1 2 3 ✓ x*
  - 2) a) If 5 coins are tossed together, what is the probability of getting exactly 2 heads ?  
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*u*

μ

$$\text{a) } T_0 = 2^5 \\ F_0 = {}^5C_2 \times \left| \frac{15}{13 \cdot 12} \right| \checkmark$$

$$\uparrow(?) = \frac{10}{25} = \underline{\underline{\frac{5}{15}}}$$

$$e) \quad T_0 = 2^4$$

FO of almost 1 tail

$$= \left( {}^4C_0 + {}^4C_1 \right) = 5$$

$$\hat{p}(\text{At least 2 T}) = \frac{5}{16}$$

$$P(\text{At least 2 T}) = 1 - \frac{5}{16} = \frac{9}{16}$$

- 3) When 2 cards are drawn simultaneously from a pack of cards, what is the probability that
  - a) one is a diamond and the other black ?
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- 4) When 2 cards are drawn one after the other from a pack of cards, without replacing the first one picked up, the what is the probability that
  - a) one is a diamond and the other black ?
  - b) one is a diamond and the other is a king ?
- 9) a) There are 5 friends. What is the probability that exactly 2 were born on the same day ?
  - b) If the no of friends are 8, what is the probability that exactly 2 were born on the same day ?
- 10) A team is playing 7 football matches in a tournament. What is the probability that the results of 4 of the matches will be predicted correctly by a spectator ?

- 5) When 2 cards are drawn one after the other from a pack of cards, replacing the first one picked up before picking the second, the what is the probability that
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- 8) There are 3 copper coins and 5 gold coins in a box. 2 coins are drawn one after the other from the box. What is the probability that the 2nd coin drawn is a gold coin, if
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- 10) A team is playing 7 football matches in a tournament. What is the probability that the results of 4 of the matches will be predicted correctly by a spectator ?
- 11) In a roadside gambling game the entry fees for a player is Rs 100. In the game the player gets a chance to throw a fair die 5 times. If 6 or 1 falls he wins Rs 120, but if any other no falls he loses Rs 42. After the game is completed what is the amount the player can expect to win ?



- 2) a) If 5 coins are tossed together, what is the probability of getting exactly 2 heads ?

$$= 52 C_1$$

- b) If 4 coins are tossed together, what is the probability of getting at least 2 tails ?

- 3) When 2 cards are drawn simultaneously from a pack of cards, what is the probability that

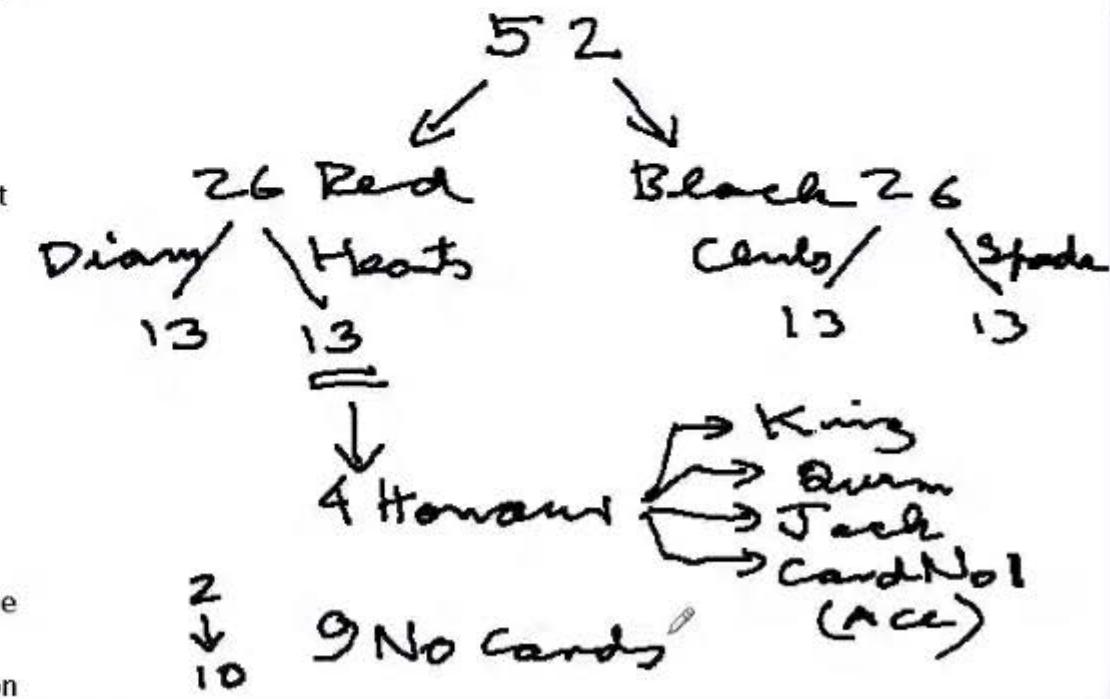
- a) one is a diamond and the other black ?  
b) one is a diamond and the other is a king ?

- 4) When 2 cards are drawn one after the other from a pack of cards, without replacing the first one picked up, what is the probability that

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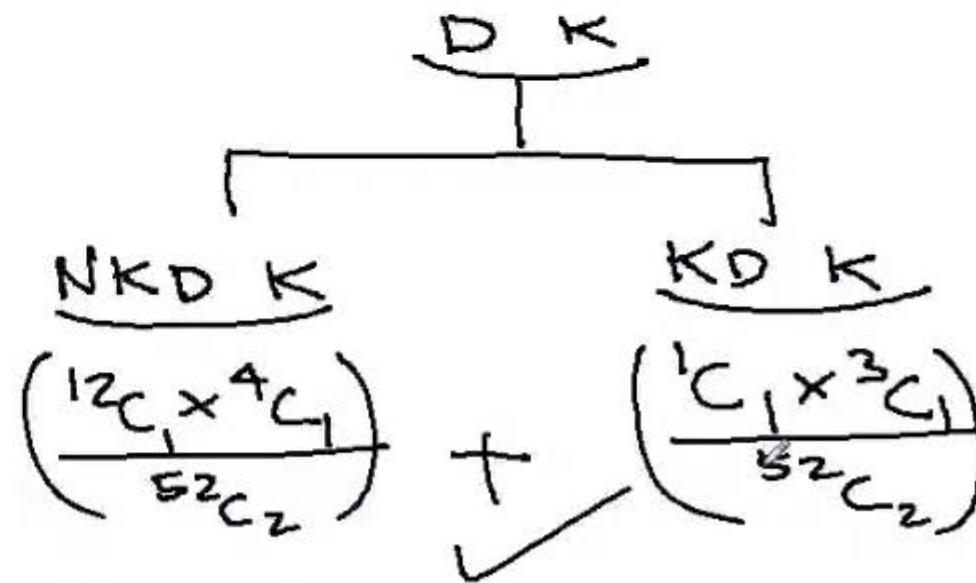
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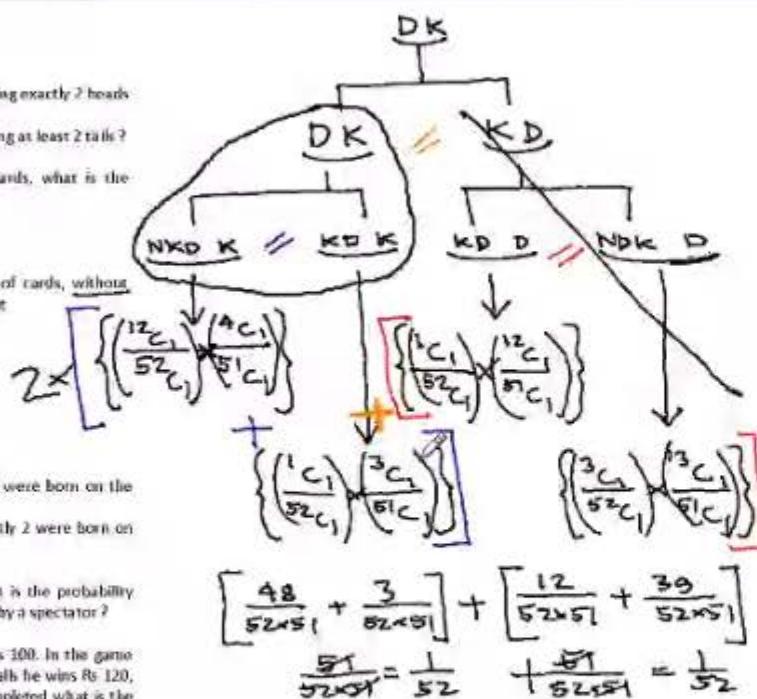
what is the probability of getting exactly 2 heads  
what is the probability of getting at least 2 tails?

simultaneously from a pack of cards, what is the  
black?

a king? ✓

for the other from a pack of cards, without  
be what is the probability that  
black?  
is a king?

eliminating



be probability that exactly 2 were born on the  
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First one picked up before picking the second, the what is the probability that

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- 6) A box contains 6 green, 5 yellow, 4 white and 3 black balls. If 2 balls are drawn simultaneously, what is the probability that both are of different colours ?

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- 7) There are two bags. One bag contains three one-rupee coins and six five-rupee coins. The other contains two one-rupee coins and seven five-rupee coins. One bag is chosen at random and one coin is randomly picked. What is the probability that it is one picked is a five rupee coin ?

- 8) There are 3 copper coins and 5 gold coins in a box. 2 coins are drawn one after the other from the box. What is the probability that the 2nd coin drawn is a gold coin, if

- a) the 1st coin is replaced ?
- b) the 1st coin is not replaced ?

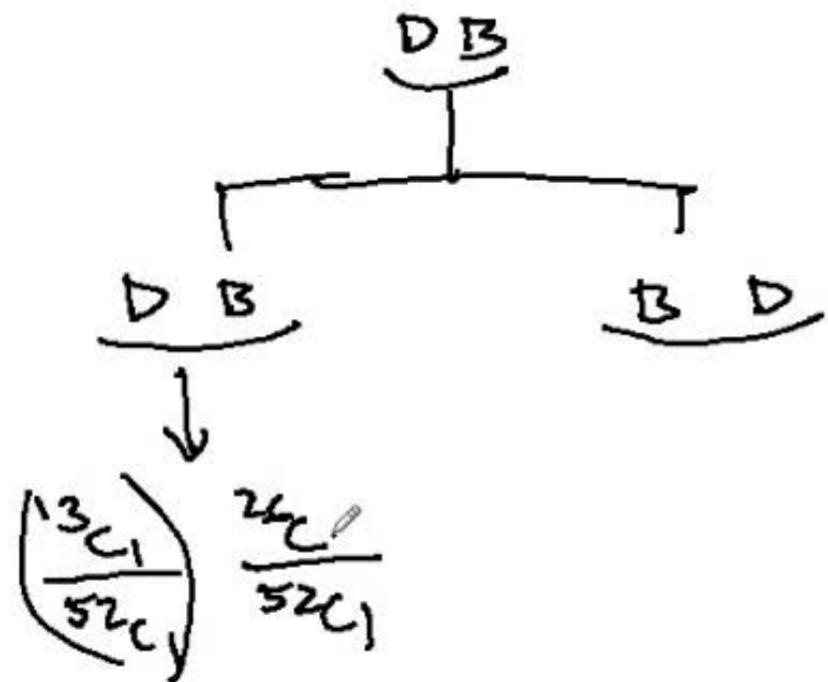
- 12) A drunk man has a probability of 1/3 of taking a forward step and a probability of 2/3 of taking a backward step. Assuming he can only move forward or backward, what is the probability that

- a) after taking 11 steps he is only 1 step away from his starting point ?
- b) after taking 10 steps he is only 1 step away from his starting point ?

- 13) Probability that A, B and C does a piece of work is 1/3, 3/4 and 2/5. Find the probability that the work gets done ?

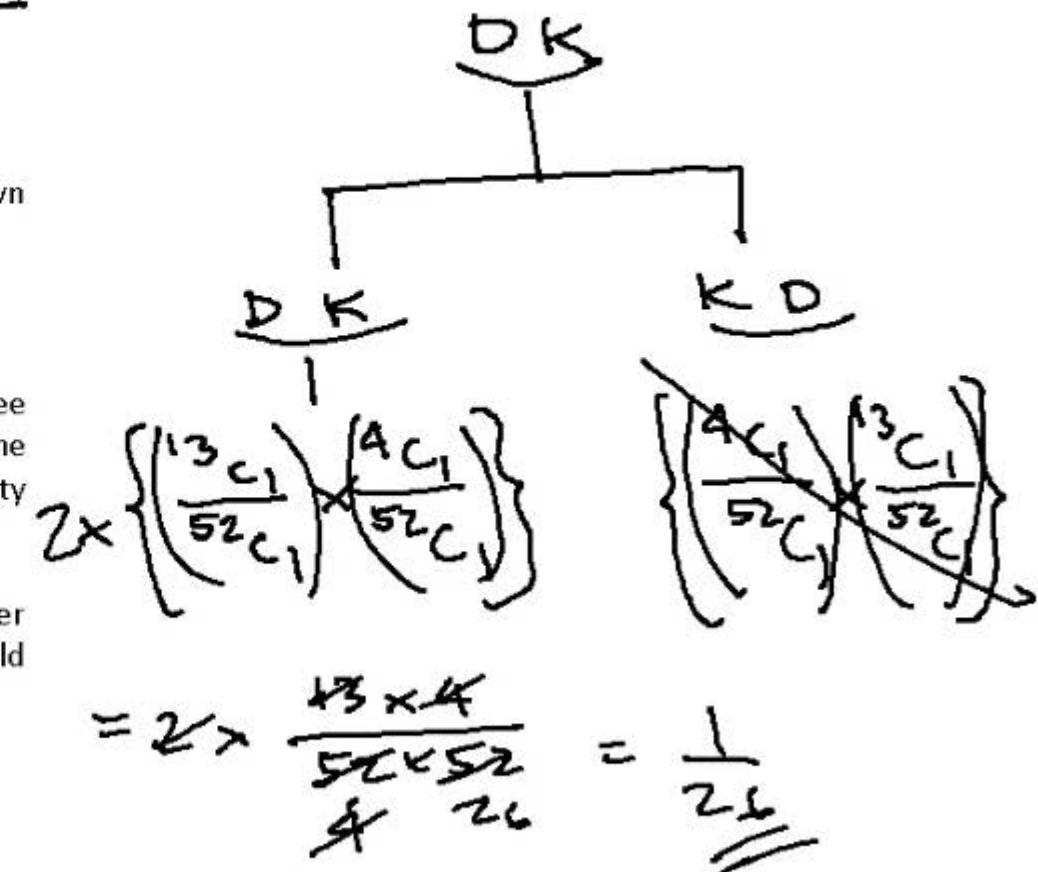
- 14) The ratio of Officers to Workers in two industrial cities A and B are 3 : 1 and 2 : 5 respectively. One of them is elected as mayor of both cities A and B. The chance that he is from city A is 2/3. Find the probability of his being a Officer ?

- 5) When 2 cards are drawn one after the other from a pack of cards, replacing the first one picked up before picking the second, what is the probability that
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$$TO = {}^8C_2$$

$$a) FO = ({}^6C_1 \times {}^3C_1)$$

e)



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TO =  ${}^{18}C_2$

Diff	Same
6	12

a) FO =  $({}^6C_1 \times {}^3C_1)$

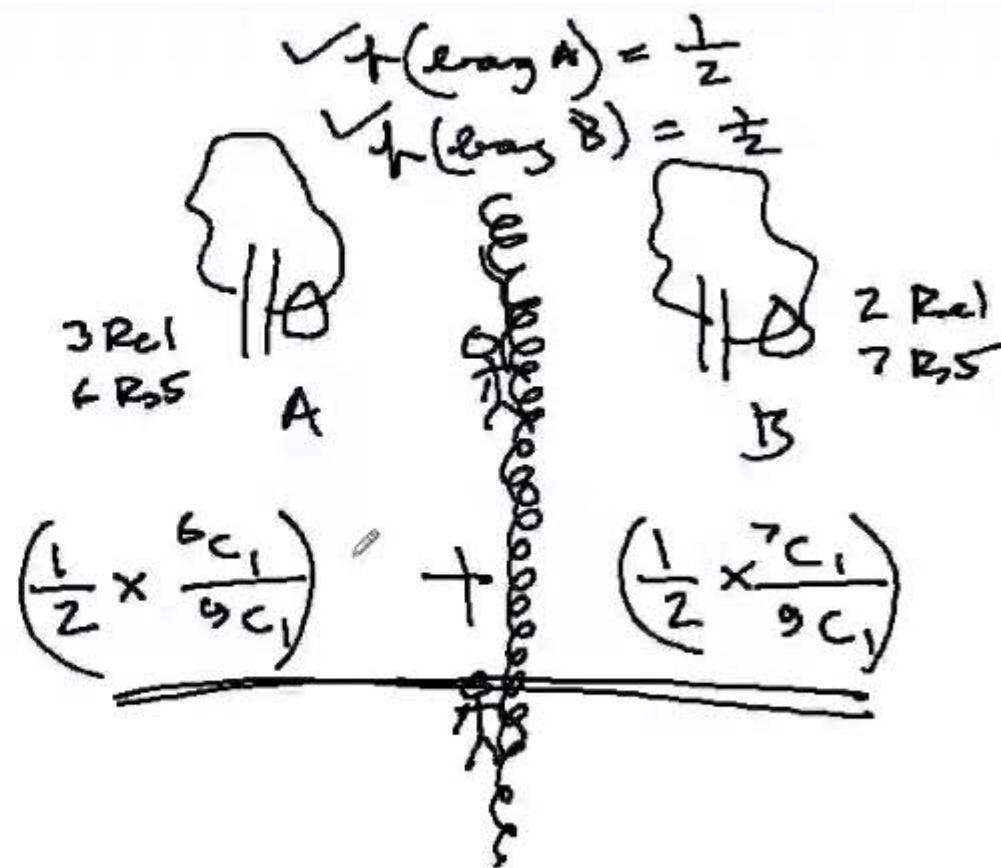
b)  $P(\text{both col same})$

$$= \frac{{}^6C_2 + {}^5C_2 + {}^4C_2 + {}^3C_2}{{}^{18}C_2}$$
$$= \frac{15 + 10 + 6 + 3}{\cancel{18 \times 17}} = \frac{34}{\cancel{18}} = \frac{2}{9}$$

$\therefore P(\text{both diff}) = 1 - \frac{2}{9} = \frac{7}{9}$

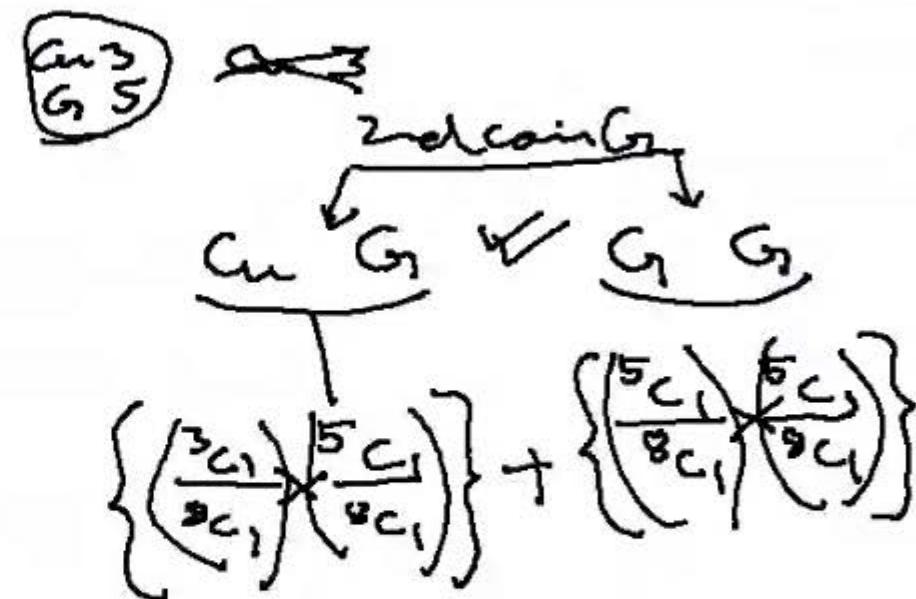


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- 6) A box contains 6 green, 5 yellow, 4 white and 3 black balls. If 2 balls are drawn simultaneously, what is the probability that both are of different colours ?
  - a) one is green and the other black ?
  - b) both are of different colours ?
- 7) There are two bags. One bag contains three one-rupee coins and six five-rupee coins. The other contains two one-rupee coins and seven five-rupee coins. One bag is chosen at random and one coin is randomly picked. What is the probability that it the one picked is a five rupee coin ?
- 8) There are 3 copper coins and 5 gold coins in a box. 2 coins are drawn one after the other from the box. What is the probability that the 2nd coin drawn is a gold coin, if
  - a) the 1st coin is replaced ?
  - b) the 1st coin is not replaced ?



$$\frac{15}{64} + \frac{25}{64} = \frac{40}{64}$$
$$= \frac{5}{8}$$

- 9) a) There are 5 friends. What is the probability that exactly 2 were born on the same day ?  
b) If the no of friends are 8, what is the probability that exactly 2 were born on the same day ?
- 10) A team is playing 7 football matches in a tournament. What is the probability that the results of 4 of the matches will be predicted correctly by a spectator ?
- 11) In a roadside gambling game the entry fees for a player is Rs 100. In the game the player gets a chance to throw a fair die 5 times. If 6 or 1 falls he wins Rs 120, but if any other no falls he loses Rs 42. After the game is completed what is the amount the player can expect to win ?



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TO  $\rightarrow 3^7$

FO  $\rightarrow {}^7C_4 1^4 \times 2^4$

Match

Me Gentle  
0 - 10  
lose win

(1  $\times$  1  $\times$  1  $\times$  1)

(2  $\times$  2  $\times$  2)



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$\text{TO} \rightarrow 3^7$

$\text{FO} \rightarrow {}^7C_4 \times 1^4 \times 2^3$

Match

Me Gentle  
0 - 10  
lose win

$(1 \times 1 \times 1 \times 1)$   
 $\underline{\underline{(2 \times 2 \times 2)}}$

$\frac{{}^7C_4 \times 1^4 \times 2^3}{3^7}$



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*'Expectation of winning'*

$$= \frac{\left(\frac{2}{6} \times 120\right) - \left(\frac{4}{6} \times 42\right)}{\frac{2}{6} + \frac{4}{6}}$$



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$$E_{\omega} = 5 \times 12 = \text{Rs } 60$$

$$\underline{100 - 60 = \text{Rs } 40}$$

$$\frac{40 - 28}{1} = \text{Rs } 12/\text{turn}$$



- 12) A drunk man has a probability of  $\frac{1}{3}$  of taking a forward step and a probability of  $\frac{2}{3}$  of taking a backward step. Assuming he can only move forward or backward, what is the probability that?
  - after taking 11 steps he is only 1 step away from his starting point ?
  - after taking 10 steps he is only 1 step away from his starting point ?

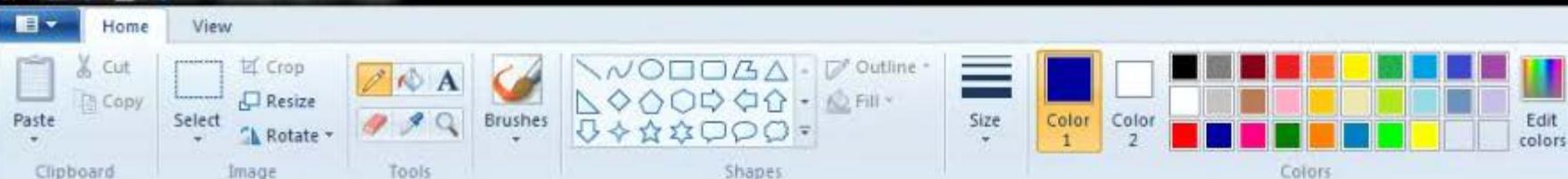


- 13) Probability that A, B and C does a piece of work is  $\frac{1}{3}$ ,  $\frac{3}{4}$  and  $\frac{2}{5}$ . Find the probability that the work gets done ?

- 14) The ratio of Officers to Workers in two industrial cities A and B are 3 : 1 and 2 : 5 respectively. One of them is elected as mayor of both cities A and B. The chances that he is from city A is  $\frac{2}{3}$ . Find the probability of his being a Officer ?

$$\text{Interf front} \quad "C_5 \times \left(\frac{1}{3} \times \frac{2}{5}\right)^5 \quad \text{Interf back} \quad "C_5 \times \left(\frac{2}{3}\right)^5$$

$$\begin{aligned} & \text{Interf front} \quad (6F + 5B) \quad \text{Interf back} \quad (5F + 6B) \\ & "C_5 \times \left(\frac{1}{3}\right)^6 \times \left(\frac{2}{3}\right)^5 \quad "C_5 \times \left(\frac{1}{3}\right)^5 \times \left(\frac{2}{3}\right)^6 \end{aligned}$$

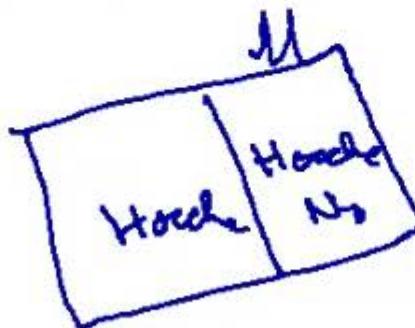


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$$\frac{1}{3} \cdot \frac{1}{4} \cdot \frac{3}{5}$$

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~~( $\overrightarrow{x} \overleftarrow{x} \overrightarrow{x}$ )~~

$A \overleftarrow{B} \overleftarrow{C} + \overrightarrow{A} \overleftarrow{B} \overleftarrow{C} + \overrightarrow{A} \overleftarrow{B} \overrightarrow{C}$

$+ \overrightarrow{A} \overleftarrow{B} \overleftarrow{C} + \overleftarrow{A} \overrightarrow{B} \overleftarrow{C} + \overrightarrow{A} \overrightarrow{B} \overleftarrow{C}$

$+ \overleftarrow{A} \overrightarrow{B} \overrightarrow{C}$

$\overrightarrow{A} \overleftarrow{B} \overrightarrow{C}$

$$P(\text{No}) = \left( \frac{2}{3} \times \frac{1}{3} \times \frac{3}{5} \right) = \frac{1}{10}$$

$$P(\text{Yes}) = 1 - \frac{1}{10} = \frac{9}{10}$$



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$$\frac{1}{2} \times \frac{2}{21} = \frac{25}{42} //$$

~~Mayor~~  $\rightarrow$  City A  $\rightarrow$  Officer

$\rightarrow$  Officer

Mayor  $\rightarrow$  City A  $\rightarrow$  Officer

$$= \left( \frac{2}{3} \times \frac{3}{2} \right) = \frac{1}{2}$$

Venn Diagram +

Mayor  $\rightarrow$  City B  $\rightarrow$  Officer  $\approx \left( \frac{1}{3} \times \frac{2}{7} \right)$

O : W from A =  $3 : 1 = \frac{3}{4}$

O : W from B =  $2 : 5$