CLOCKS

Concept 1- Understanding the Structure

- **Minute Spaces**
- The face or dial of clock is a circle whose circumference is divided into 60 equal parts, named minute spaces

- **Hour hand and minute hand**
- A clock has two hands. The smaller hand is called the hour hand or short hand and the larger one is called minute hand or long hand

- Angle traced by hour hand in 12 hrs = 360°

⇒**Speed of an hour hand =1/2 ° per minute.**

- Angle traced by minute hand in 60 min. = 360°

=>Speed of a minute hand = 6° per minute.

COMPARISON OF SPEED OF HANDS:-

- The difference in the speed = 6°– (1/2°) = 5.5° per minute
- Comparing the speed of the minute hand and an hour hand, one can conclude that the minute hand is always faster than the hour hand by 5.5° or an hour hand is always slower than the minute hand by 5.5°

1 . An accurate clock shows 8 o'clock in the morning. Through how may degrees will the hour hand rotate when the clock shows 2 o'clock in the afternoon?

A. 144°

B. 150°

C. 168°

D. 180°

2 . A clock is started at noon. By 10 minutes past 5, the hour hand has turned through:

A. 145°

B. 150°

C. 155°

D. 160°

Answer: Option **C**

Explanation:

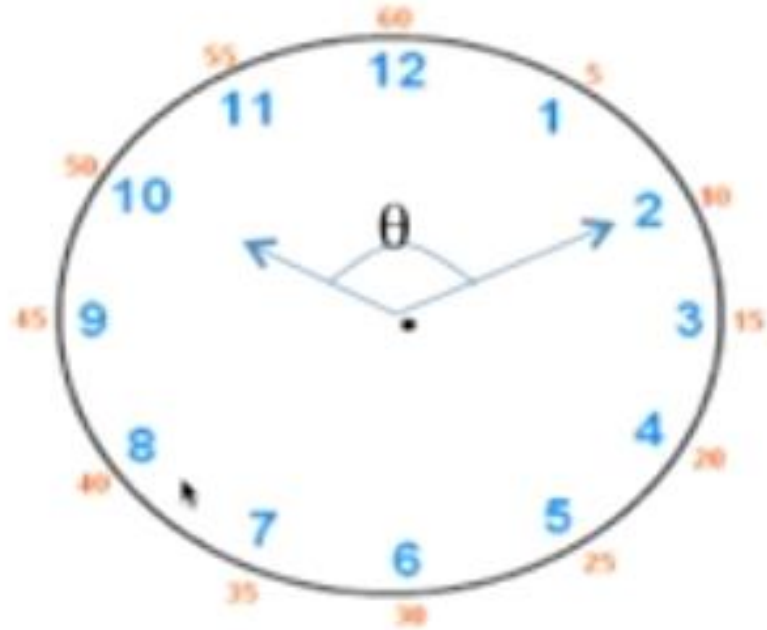
Angle traced by hour hand in 12 hrs = 360°.

Angle traced by hour hand in 5 hrs 10 min. *i.e.*, $\frac{31}{6}$ hrs = $\left(\frac{360}{12} \times \frac{31}{6}\right)^{\circ}$ = 155°.

Concept II : Angle between the hour hand and the minute hand

$$\theta = \left| \frac{11}{2} m - 30 h \right|$$

where θ = angle b/w two hands,
m = minutes and h = hours



Sample Question

At 7:20 what will be the angle between the hour hand and the minute hand ?

a) 60^0

b) 100^0

c) 30^0

d) 50^0

Q. At what angle the hands of a clock are inclined at 15 minutes past 5?

A. 58.5
B. 64
C. 67.5
D. 72.5

Concept III : No. of times an angle is made

θ	12 Hours	24 Hours
0^0, 180^0	11	22
$0^0 < \theta < 180^0$	22	44

Conclusion :

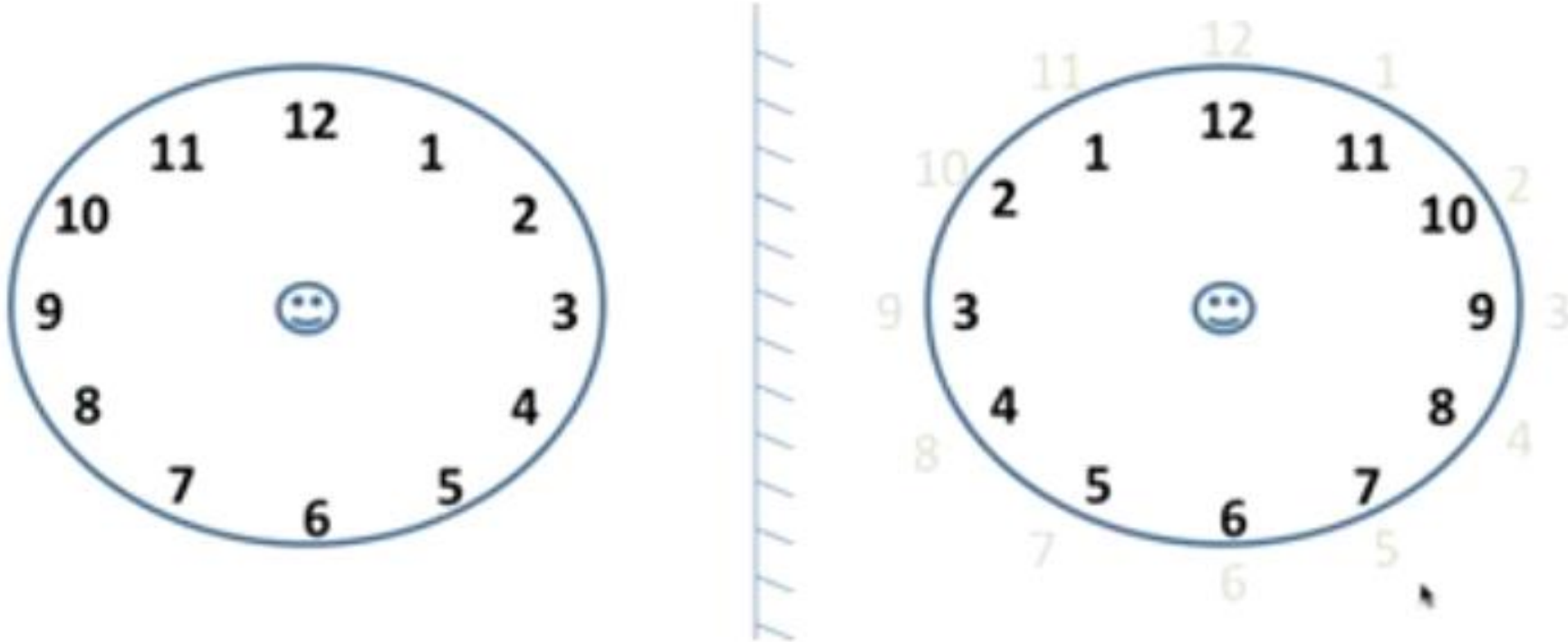
The two hands of a clock will coincide the first time after 65 5/11 minutes i.e. at 1:05 (approximately) then at 2:10, 3:15, 4:20, 5:25 …… 12:00. Note that the hands of the clock do not meet between 11 and 12 o'clock but straight at 12. Hence in 12 hours the hands meet 11 times.

Each angle between 0 to 180 is formed 22 times in 12 hours whereas 0 & 180 are formed 11 times each.

Q. How many times are the hands of a clock at right angle in a day?

A. 22
B. 24
C. 44
D. 48

Concept IV : The Concept of Mirror Image



To find the mirror image of any given time, subtract the value from 11:60

i.e. Given Time + Mirror Image Time = 11:60

If the time in the clock shows 7 hrs 35 minutes, then what time will it show in the mirror?

a) 6 hrs 20 minutes

b) 4 hrs 25 minutes

c) 5 hrs 25 minutes

d) None of the above

Blood Relations

Definition and Concept

- Blood Relations mean persons of a family connected by relationships like father-mother, son-daughter, brother-sister, grandfather-grandmother, uncle-aunty, nephew-niece, brother-in-law - sister-in-law etc. In other words, it represents the Family Tree.
- Questions in Test of Reasoning on Family/Blood Relationship are about the relationship of a particular person with another person of the family, based on the chain of relationships between other members of that family.
- Family/Blood Relation Tests are an exercise to test the student’s ability to comprehend and come to the crux of an issue from complex, lengthy and even confusing data.

Relation	Commonly Used Terms
Grandfather's or Grandmother's only son	Father
Grandfather's or Grandmother's only daughter-in-law	Mother
Father's father or Mother's	Grandfather
Father's Mother or Mother's	Grandmother
Father's brother or Mother's	Uncle
Father's sister or Mother's	Aunt
Son's wife	Daughter-in-law
Daughter's husband	Son-in-law
Husband's or wife's sister	Sister-in-law
Husband's or wife's brother	Brother-in-law
Brother's wife	Sister-in-law
Brother's or sister's son	Nephew
Brother's or sister's daughter	Niece
Uncle's or aunt's son or daughter	Cousin
Sister's husband	Brother-in-law
Brother's wife	Sister-in-law
Grand son's or grand daughter's daughter	Grand Grand Daughter
Grand son's or grand daughter's son	Great Grand Son

In-laws

In-laws only apply to brother, sister and parents.

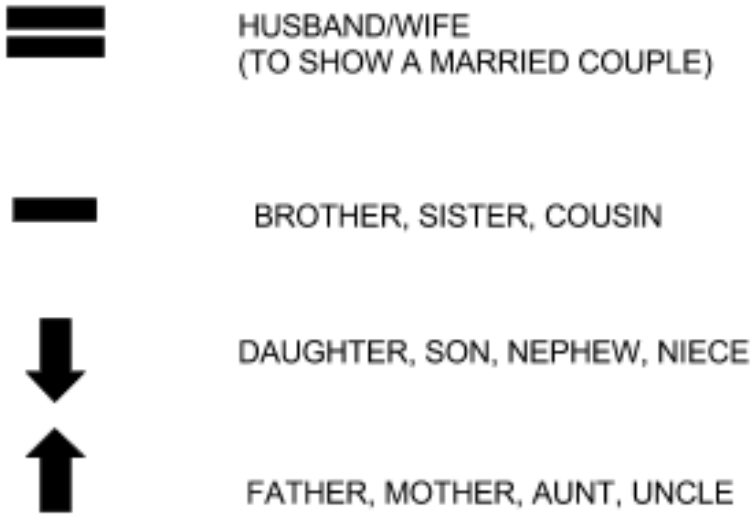
e.g. There is no relationship between you and your spouses cousins. My sister-in-law could be:

1. the sister of my spouse, or
2. the wife of my brother, or
3. the wife of my spouse's brother.

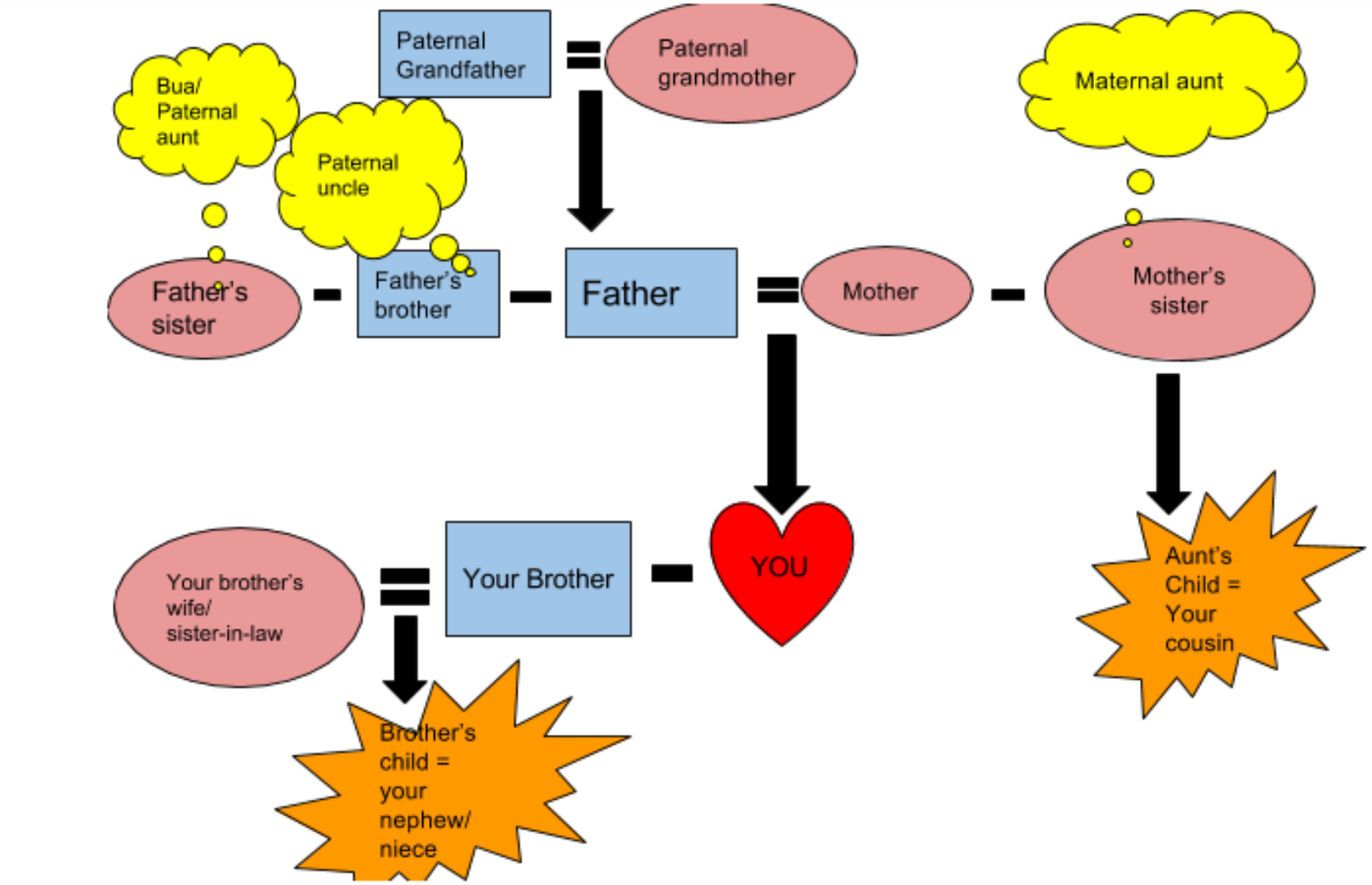
How to draw the diagram

While making the diagram for a given question, use some particular representations of your own so that you can identify the different relations. You can also use the **KEY** given below

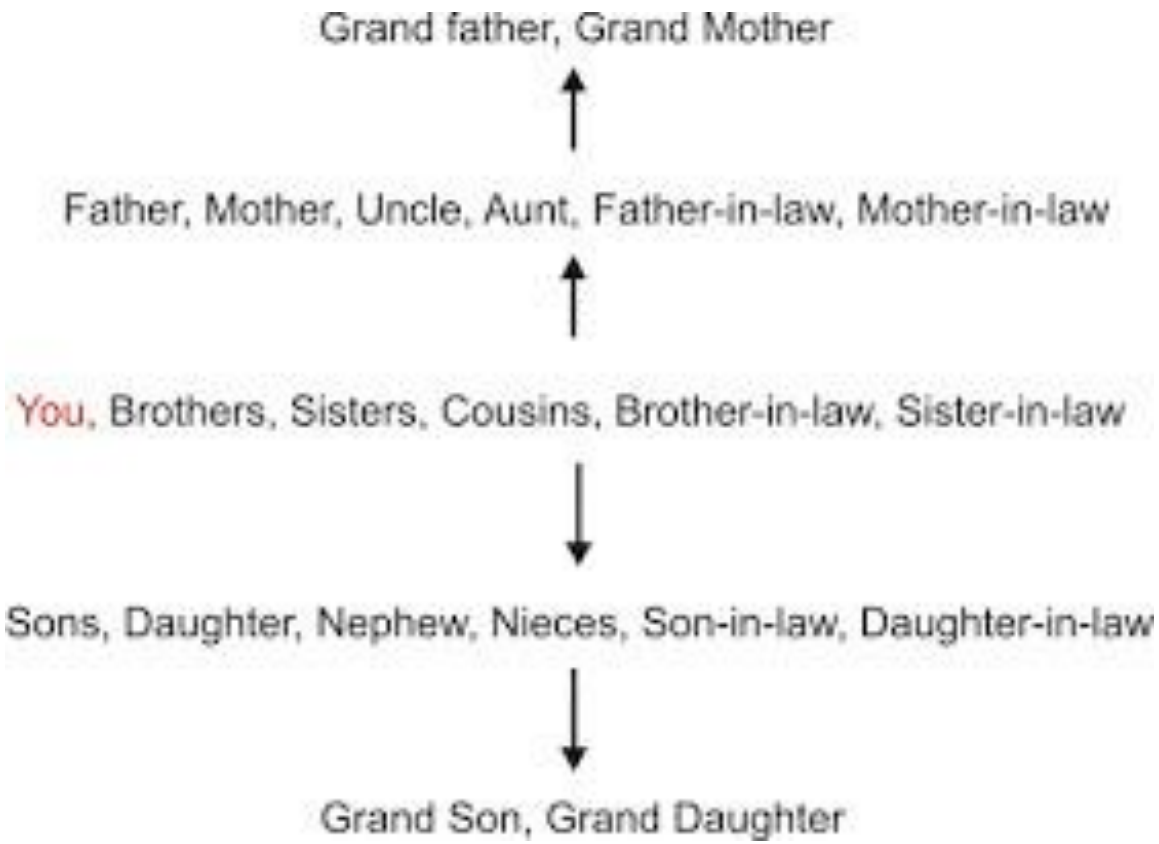
KEY



Example of how you should draw a diagram – Here, a rectangle and a circle is used to represent a male and a female respectively. Also follow the keys given in the previous slide.



Terms related to a particular generation in a family



DIRECT Single Person Blood Relations:

Break the given sentence at **is/was/as** and resolve it from last point to **is/was/as** to get easy solution for the problem without drawing the diagram.

Ex – 1 : Pointing to a lady, Ravi said," She is the only daughter of the father of my sister's brother". How is she related to Ravi?

Solution :

Break the given sentence at **is**.
From the last, in the view of Ravi,
My sister's brother – brother
Father of brother – father
Daughter of father – sister
So,that becomes "she is my sister"
So, answer is sister.

Ex-2 : John introduces Mary as the daughter of the only son of my father’s wife. How is Mary related to John?

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Solution :
Break the given sentence at **as**.
Resolving from the last , In the view of john,
My father's wife – mother
Only son of mother – himself i.e. john
Daughter of john– daughter.
So, answer is daughter.

NOTE : Sometimes they might ask like how is john related to Mary. In that case answer is father. So, don't make answers without clear understanding in this type of problems.

INDIRECT Single Person Blood Relation:

Break the given sentence at **is/was/as**.

Resolve the sentence in the inverted commas from last upto **is/was/as.**

And also resolve the sentence in the inverted commas from the first upto **is /was/as.**

Then you will get easy solution. Observe the below examples.

Ex-3 : Pointing to a man in the photograph, a Woman says,''His mother's only daughter is my mother". How is man related to woman?

Solution :
Break the sentence at **is.**
From the last, up to **is** : my mother – Woman's mother
From the first, up to **is** : his mother's only daughter – his sister
His sister = woman's mother.
So, the answer is Mother's brother i.e. Uncle.

If question asks like how is woman related to that man? Then answer is sister's daughter i.e. niece.

Ex-4 : Introducing Suresh, Kalpana said,” His brother’s father is the only son of my grandfather”. How is Kalpana related to Suresh?

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Solution :
Break the sentence at **is.**
From the last up to **is** : The only son of my grandfather – Kalpana's father
From the first up to **is** : his brother's father – Suresh's father
Suresh's father = Kalpana's father
So, they are brother & sister.
Answer is sister.

Mixed Blood Relations

In this, mutual blood relations depending on more than two persons mentioned. These type of problems can be solved with the help of diagrams. Follow these symbols in the diagram to avoid confusion.

+ Male candidate
– Female candidate
<=> Couple
- - - - Same generation i.e.brother –brother (or) sister-sister (or) sister to brother
——— Different generations i.e. father-son (or) mother-son (or) father – daughter (or) Mother – daughter

The following list of generation might be helpful to you.

First generation : Grand father, Grand mother
Second generation : Father, Mother, Uncle, Aunt.
Third generation : Self, Sister, Brother, Sister in law, Brother in law
Fourth generation : Son, Daughter, Nephew, Niece.

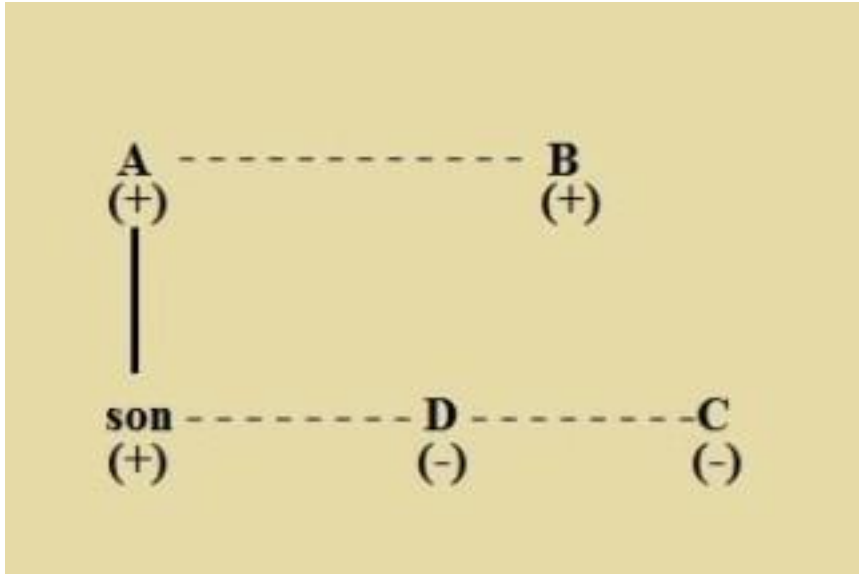
Better to use the same generation in one horizontal row in the diagrams.

EX – 5 :

A and B are brothers and C and D are sisters. A's son is D's brother. How is B related to C?

Solution:

By using above notations we can draw the below diagram. A,B are taken '+' and C ,D are taken as '-'. It seems that A,B belongs to one generation and C,D belongs to another generation. So, A,B are taken in one horizontal row and C,D are taken in other horizontal line. It says that A is C's father. Father's brother is uncle. **So, answer is uncle.**



SEATING ARRANGEMENTS

Read the entire puzzle and understand the statements correctly

- Identify the statements that give definite information
- For instance, let us take three statements and evaluate them

Statement 1: A is to the left of B.

The data in the statement is basic but not definite as the statement ONLY says that A is to the left of B. but, it does not specify where A is located from B.

Statement 2: A is second to the left of B. The data in the statement is definite as it clearly states that A is placed second to the left of B.

Some important points to be kept in mind before solving the sitting arrangement puzzles are:

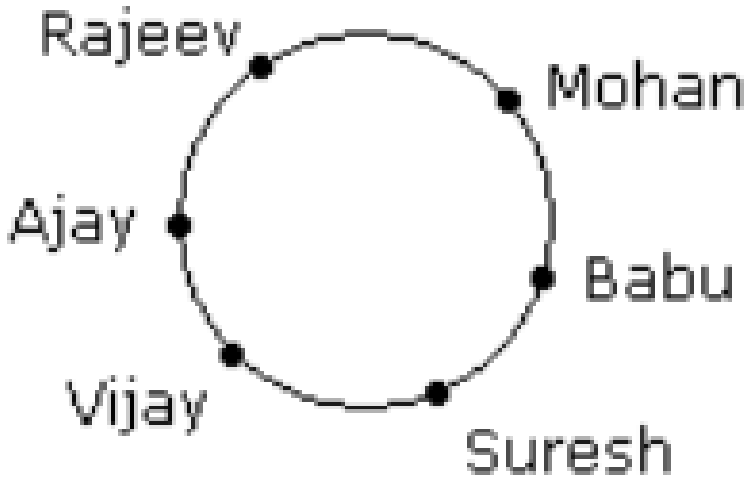
- If A is sitting immediate left of B, it means B is on the immediate right of A
- To avoid confusion of left and rights in circular and other shapes' seating arrangement problems, you should assume that all people are facing to the center (unless and until they specify the direction)
- It's always a better idea to assume you are one among them so that it will be easier for you to get an idea of the arrangement
- If you are unable to get the idea from a line then better skip that line and go to the next line. You can revisit the skipped line after getting another clue

Example 1:

1. 6 Boys are sitting in a circle and facing towards the centre of the circle.
2. Rajeev is sitting to the right of mohan but he is not just at the left of Vijay.
3. Suresh is between Babu and Vijay.
4. Ajay is sitting to the left of Vijay.

Who is sitting to the left of Mohan ?

Solution :



Hence, Babu is sitting to the left of Mohan.

Example 2:

1. Eleven students A, B, C, D, E, F, G, H, I, J and K are sitting in first line facing to the teacher.
2. D who is just to the left of F, is to the right of C at second place.
3. A is second to the right of E who is at one end.
4. J is the nearest neighbour of A and B and is to the left of G at third place.
5. H is next to D to the right and is at the third place to the right of I.

Who is just in the middle ?

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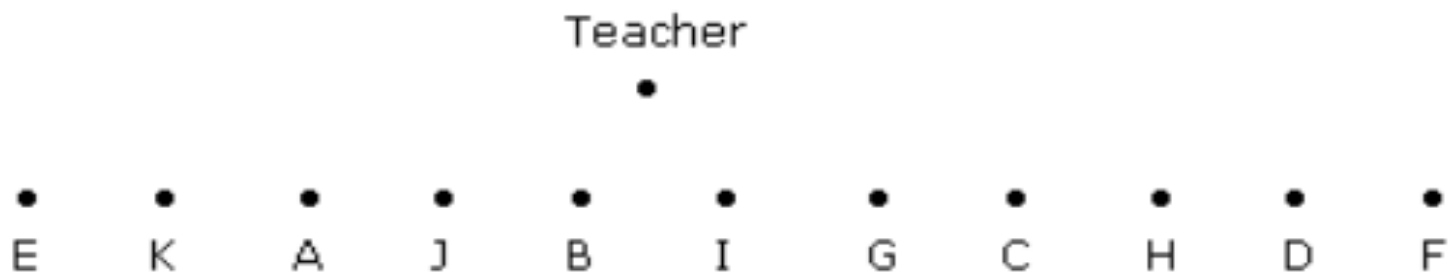
4. J is the nearest neighbour of A and B and is to the left of G at third place.

5. H is next to D to the right and is at the third place to the right of I.

Who is just in the middle ?

2. C _ D F
5. I _ _ H D
Combining.. I _ C H D F

Solution :



Hence, I is just in the middle.

Example 3

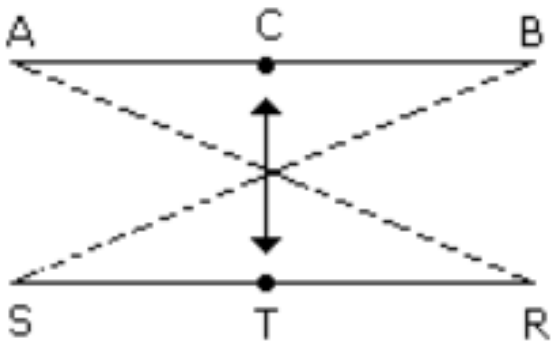
1. A, B and C are three boys while R, S and T are three girls. They are sitting such that the boys are facing the girls.
2. A and R are diagonally opposite to each other.
3. C is not sitting at any of the ends.
4. T is left to R but opposite to C.

(A). Who is sitting opposite to B ?

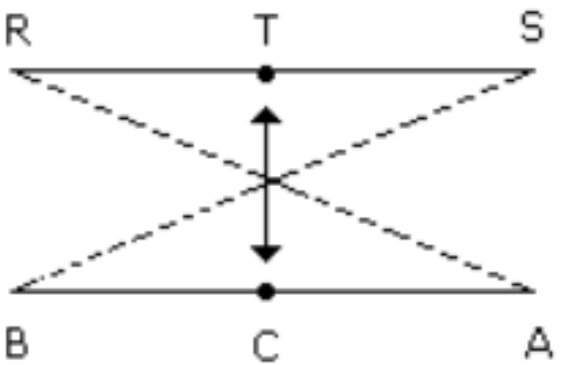
(B). Who is sitting diagonally opposite to B ?

Solution :

I st position



II nd position



(A). Hence, R is sitting opposite to B.

(B). Hence, S is sitting diagonally opposite to B.

THANK YOU