ESTD. 2000 Reg. No.: S000176

NAVPRAYAS
(A GROUP OF INNOVATIVE THOUGHTS)

PUZZLE RACE

Senior Group (IX-X) Question Paper 2025

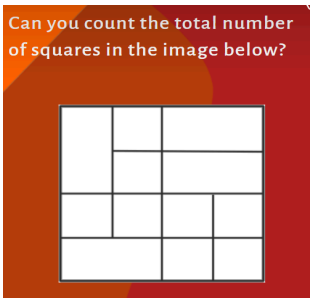
Qualifier 1

What are the next two numbers in the series?

7645, 5764, 4576, ? , ?

Round A

A1.



A2.

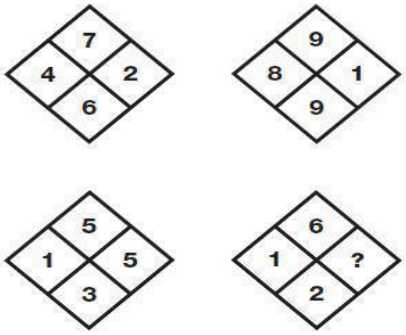
I have a neck, but no head. I have two arms, but no hands. What am I?

A3.

Pointing to a photograph, Ramesh said, “He is the son of the woman who is the daughter of the only son of my grandfather’s wife.”
How is the man in the photograph related to Ramesh?

A4.

Find the missing number.

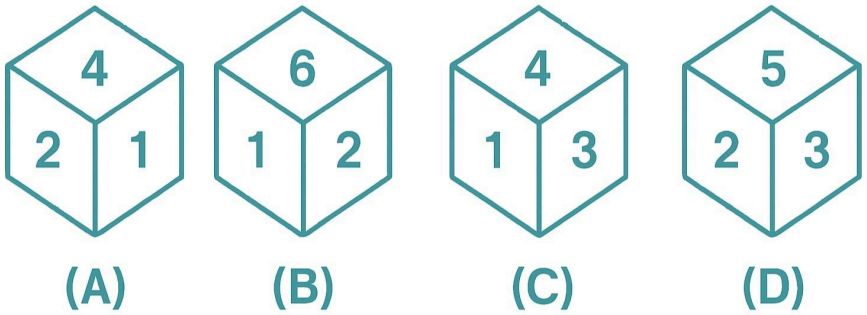


A5.

If five cats can catch five mice in five minutes, how long will it take one cat to catch one mouse?

A6.

What is an example of a standard dice?



A7.

Find odd one out from the given jumbled words.

LNUAIMMIU, ELEST, OPERPC, NMKOYE, CIESANR, ROMITTSNU

A8.

A man fell in a 50m deep well. He climbs 4 meters up and slips 3 meters down in one day. How many days would it take for him to come out of the well?

A9.

Two beauticians have three customers, each needing a facial and a manicure.
Each hairdresser takes fifteen minutes for a facial, and five minutes for a manicure. Facial and manicure both can be done at the same time if beauticians are available. What's the minimum time in which they can get the job done?

A10.
One rabbit saw 6 elephants while going towards River. Every elephant saw 2 monkeys are going towards river. Every monkey holds one tortoise in their hands.

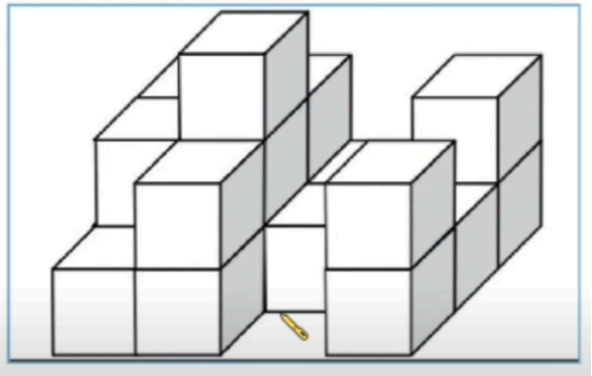
How many animals are going towards the river?

Qualifier 2

A cube is painted on all sides and cut into 64 small cubes. How many small cubes have exactly two faces painted?

Round B

B1.
.Count the number of cubes in the given figure:



B2.
Five girls are sitting in a row. Ruhi is sitting on the extreme left & adjacent to Khushi. Tina and Khushi are not sitting together. Sinu and Pihu are sitting Together but Sinu is not sitting next to Tina. Who are sitting at the extreme ends of the row?

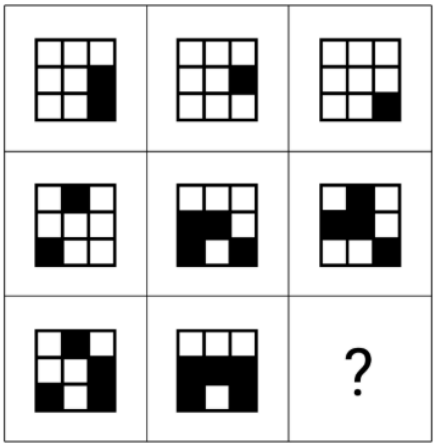
B3.
A man traveled 5,000 miles in a 4-wheeler car with one spare tire. He rotated tires at intervals so that when the trip ended each tire had been used for the same number of miles. For how many miles was each tire used?

B4.
A woman shoots her husband. Then, she holds him underwater for over 5 minutes. Finally, she hangs him. But 5 minutes later, they both go out together and enjoy a wonderful dinner. How can this be?

B5.
What mathematical symbol do you have to insert in between the numbers to get the correct result? Note that only the symbols +, -, × and ÷ are used.There are two possible solutions. Write both the solutions.

2 4 6 8 = 6

B6. Find the correct option in place of question mark.



B7.
What is the minimum number of weighing operations required to measure 31 kg of wheat if only one weight of 1 kg is available?

B8.

Find the missing number.

5, 7, 21, 55, ?, 215

B9.

A thief wants to open a lock with 5 digits as the key to open it. He knows that the 3rd digit is three less than the 2nd digit, while the 2nd digit is four smaller than the 4th digit. The first digit is three times the fifth digit. There are three pairs whose sum is 11 and the third and fifth digits are equal. Find the key to open the lock.

B10.

A tank has two taps and one drain.
Tap A fills the tank in 3 hours.
Tap B fills the tank in 6 hours.
The drain, when open alone, empties the full tank in 2 hours.
One morning, the gardener opens Tap A and the drain together. After 1 hour, he opens Tap B too.
Exactly how long after Tap B is opened will the tank be full?

Qualifier 3

Using only addition, add eight 8s to get the number 1,000.

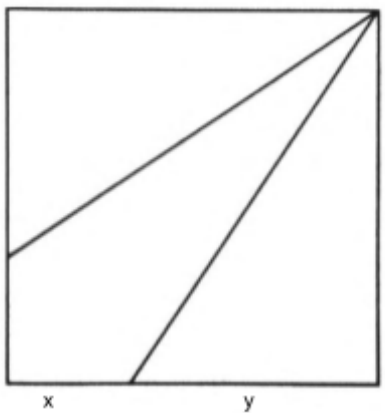
Round C

C1.

I add 5 to 9 and get 2. How's it possible?

C2.

From one corner of a square extend two lines that exactly trisect the square's area [see Figure]. Into what ratios (x:y) do these trisecting lines cut the two sides of the square?



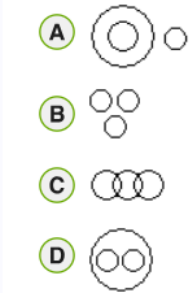
C3.

Select the alternative which represents three out of the five alternative figures which

when fitted into each other would form a complete square.

C4.

1. Which of the following diagrams indicates the best relation between Travelers, Train and Bus ?



C5.
Find the number that will come in the place of the question mark in the given series

4, 18, ?, 100, 180, 294, 448.

C6.
Two runners start together on a circular track, running at different constant speeds. If they head in opposite directions they meet after a minute; if they head in the same direction, they meet after an hour. What is the ratio(higher:lower) of their speeds?

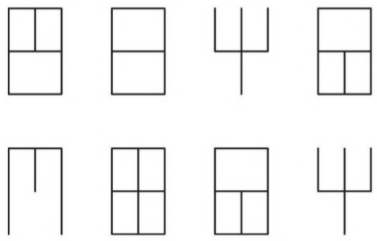
C7.
Earth was under attack by marauding Mechanoids—robotic machine aliens from another world. Five Earth Force pilots returned from a sortie into space after destroying several Mechanoid Battle Drones. Ibrahim shot down 10 more than Juan. Luke shot down 4 less than Ibrahim. Juan and Vladimir shot down 9 between them. Vladimir shot down 2 more than Chi, but Luke shot down 3 more than Vladimir.
How many Battle Drones were shot down in all?

C8.
You have 8 coins, all of which are identical in size and appearance, but one of them is heavier than the others.You also have a balance scale.What is the minimum number of weighings needed to find the heavier coin?

C9.
There are two natural numbers, difference of their squares is cube and difference of their cubes is squares. Can you find the smallest possible numbers?

C10.
Look at these digital hieroglyphs, reflect on them a little, and then work out, what

the sixteen-digit number sequence is.



Qualifier 4

There are 70 teachers employed with hitbullseye company, of which 30 are females.
(1) 30 teachers are married.

(2) 24 teachers are above 31 years of age.

(3) 19 married teachers are above 31 years of which 7 are males.

(4) 12 males are above 31 years of age.

(5) 15 males are married.

How many of unmarried females are above 31 years of age?

Round D

D1.

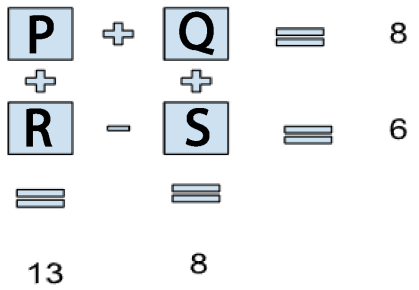
How do you go from 98 to 720 using just one letter ?

D2.
Find all integer-sided rectangles with equal area and perimeter. {by finding the rectangle here means that you have to tell the dimension of such rectangles}.

D3.

You have a 3-litre bottle and a 5-litre bottle. In how many minimum steps can you measure exactly 4 litres of water using only these 2 bottles ?Adding, pouring and emptying are considered as steps.

D4.
Find P,Q,R,S.



D5.

A customer enters a foreign exchange kiosk to convert an unknown amount of money he has in rupees and paise. Due to an error, the clerk accidentally interchanges the rupee and paise digits—treating the number of paise as rupees and rupees as paise. The customer, unaware of the mistake, spends ₹2.78 on snacks. After the purchase, he realizes that the amount of money left is exactly double what he originally intended to exchange. What was the correct original amount of money he had?

D6.
Sumit drove at a steady clip along the highway, his wife beside him. “Have you noticed,” he said, “that those annoying signs for BombayBazaar seem to be regularly spaced along the road?
Mrs. Sumit(wife) glanced at her wristwatch, then counted the number of BombayBazaar signs they passed in one minute.
“What an odd coincidence!” exclaimed Sumit. “When you multiply that number by 10, it exactly equals the speed of our car in miles per hour.”
Assuming that the car’s speed is constant, that the signs are equally spaced, and that Mrs. Sumit’s minute began and ended with the car midway between two signs. How many signs did her wife see in one mile?

D7. SKIPPED

D8.
There is a non-zero number which is very peculiar. This number is three times the sum of its digits. Can you find the number.

D9.
There are four clusters of Oranges, Apricots and Bananas as follows:

Cluster I : 1 Orange, 1 Apricot and 1 Banana

Cluster II : 1 Orange, 5 Apricot and 7 Bananas

Cluster III : 1 Orange, 7 Apricots and 10 Bananas

Cluster IV : 9 Oranges, 23 Apricots and 30 Bananas

Cluster II costs Rs 300 and Cluster III costs Rs 390.

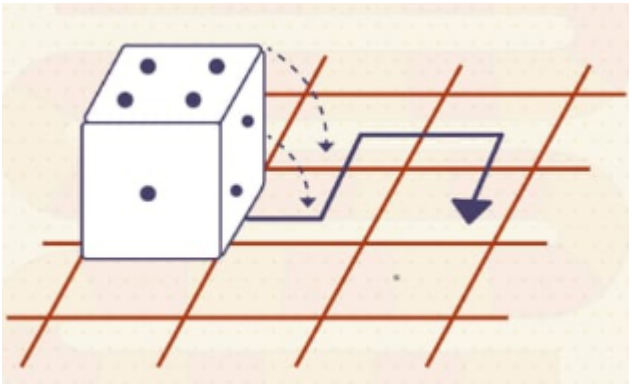
Can you tell how much does Cluster I and Cluster IV cost?**.**

D10.
Alok has three daughters. His friend Shyam wants to know the ages of his daughters. Alok gives him a first hint.

1. The product of their age is 72.
   Shyam says this is not enough information Alok gives him a second hint.
2. The sum of their ages is equal to my house number.
   Shyam goes out and looks at the house number and says “I still do not have enough information to determine the ages”. Alok admits that shyam can not guess and gives him a third hint.
3. The oldest girl likes strawberry ice cream.
   Shyam is able to guess after the third hint. Guess the ages of the three daughters.

Qualifier 5

If the dice is rolled on the shown path,what will be the number on top?

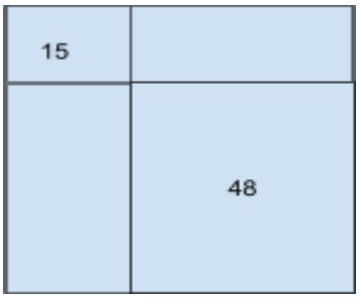


Round E

E1.

Use 6 matches to make 4 triangles of equal size and equal shape such that no matchsticks intersect. What is the sum of the number of edges and faces of that figure ?

E2.
Consider the following figure and answer the item that follows:



A square is divided into four rectangles as shown above. The lengths of the sides of rectangles are natural numbers. The areas of two rectangles are indicated in the figure.What is the length of each side of the square?

E3.
In a joint family of seven persons L, M, N, O, P, Q, and R, two are married couples. R is a housewife and her husband is a lawyer. N is the wife of M, L is an engineer and is the granddaughter of R, and O is the father-in-law of N, a doctor, and father of P, a professor. P and M are siblings of the same gender. Q is L's brother and M's son. How is L related to O and how many males are there in the family?

E4.
A ship is moored at the docks. A ladder with rungs a foot apart is hung over the side, with twelve rungs showing from the deck to the sea. If the tide rises at the rate of half a foot an hour, how much of the ladder will still be above water after four hours?

E5.
A boy goes to 20 of his friend's houses with 'n' number of newly purchased marbles in his hands. At every house he visits , he gives away half of marbles he have and take one of his friend's marble's and adds it with the one's he is left with , he never had a problem of dividing an odd number of marbles left and finally after leaving his 20th friends house, he is left with 2 marbles, can you guess the 'n' value?

E6.
Find one four-digit number (between 1000 and 9999) such that :
1. It is a perfect square.
2. Reversing its digits also gives a perfect square and having 4-digits.

E7.
A traveler needs to cross a river, but he has a wolf, a goat, and a cabbage. If he leaves the goat alone with the wolf or the cabbage alone with the goat, they will be eaten. He can only take one item at a time, and the boat cannot be left unattended. How can he get all his items across the river?

E8.
You have got someone working for you for five days and a gold bar to pay him. You must give them a piece of gold at the end of every day. What are the fewest number of cuts to the bar of gold that will allow you to pay him 1/5th each day?

E9.
Two identical cups are filled with equal volumes: one with pure coffee, the other with pure milk. A spoonful of milk is transferred from the milk cup to the coffee cup. After mixing thoroughly, the same volume of the coffee-milk mixture is transferred back to the milk cup. After these two transfers, is there more milk in the coffee cup or more coffee in the milk cup a— or are the amounts equal?

E10.
I went on a holiday to a hill station. It snowed for 15 days. But when it snowed in the morning the afternoon was lovely. And when it snowed in the afternoon the day was preceded by a clear morning. Altogether there were 14 very nice mornings and 17 very nice afternoons. How many days did my holiday last?

Qualifier 6

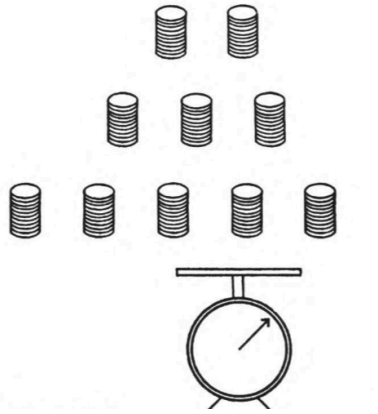
Letters D to Z is categorized into 4 groups.Which group does the letter G and I belong to?

1	K	J		
2	D	E		
3	U		V	M
4		N	S	O

Round F

F1.

You have 10 stacks of coins, each consisting of 10 half-dollars(each of the same weight and known to you). One entire stack is different, but you do not know which one. You do know the weight of a genuine half-dollar and you are also told that each different coin weighs one gram more than it should. You may weigh the coins on a pointer scale. What is the smallest number of weighings necessary to determine which stack is different?



F2.

Amla, Bamla, Camla, Damla and Emala are good friends. Only two of them are always honest. The other three persons are sometimes honest and sometimes not. When they were asked about who is a liar. Here are the answers from them:

1. Amla said: Bamla is not a lier.
2. Bamla said: Camla is a liar.
3. Camla said: Damla is a liar.
4. Damla said: Emala is a liar.
5. Emala said: Bamla is a liar.
6. Amla said: Emala is not a liar.
7. Emala said: Camla is a liar.

Find out which two persons are always honest?

F3.

A secret locker can only be opened using a 3-digit code.

You try the following combinations and get hints:
1. 682 – One digit is correct and in the correct place.
2. 614 – One digit is correct but in the wrong place.
3. 206 – Two digits are correct but both are in the wrong place.
4. 738 – Nothing is correct.
5. 380 – One digit is correct but in the wrong place.

What is the 3-digit code to open the locker?

F4.

The Bridge at Midnight

Four people need to cross a bridge at night. They have one torch. The bridge can hold only two people at a time.

They walk at different speeds:

Person A: 1 minute

Person B: 2 minutes

Person C: 5 minutes

Person D: 10 minutes

When two people cross, they walk at the slower person's speed.

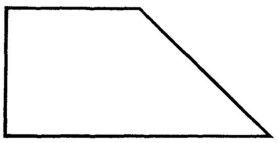
What's the fastest time for all four to cross?

F5.

There are three light switches outside a room. One of them controls a bulb inside the room. You can turn the switches on and off and check the room only once. How do you find which switch controls the bulb?(The bulb was initially off)

F6.

The shape shown in the sketch below, obviously, is that of a square attached to half of another similar square, divided diagonally:



Can you divide it into four pieces all of precisely the same size and shape?

F7.

There are **1000 lockers**, all initially **closed**, and **1000 students**.

- Student 1 walks by and **opens every locker**.
- Student 2 walks by and **toggles every 2nd locker** (closes it if it's open, opens it if it's closed).
- Student 3 toggles **every 3rd locker**.
- Student 1000 toggles **every 1000th locker**.
- After all 1000 students have done their thing, **how many lockers remain open.**

F8.

Can you arrange the following figures in two groups of four figures each so that each group shall add to the same sum?

1 2 3 4 5 7 8 9

If you were allowed to reverse the 9 so as to change it into the m issing 6 it would be very easy. For example, 1, 2, 7, 8 and 3, 4, 5, 6 add up to 18 in both cases. But you are not allowed to make any such reversal.

You can also add like this :- 123+4=127 and 57+89=136

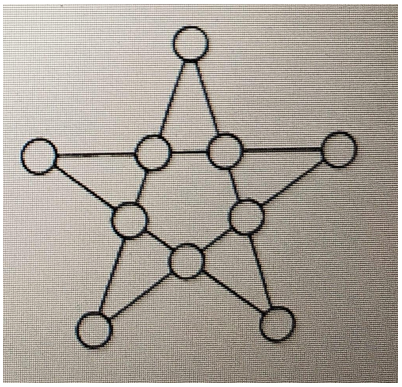
F9.

A man goes into a bank with 1,023 one-dollar bills and ten bags. He requests the money be distributed among the bags so that he can be given any amount from $1 to $1,000 by handing over one or more whole bags (without reopening them or combining loose bills).

What should be the content of the ten bags?

F10.

Take the case of the simple five pointed star . It is required to place a different number in every circle so that the four circles in a line shall add up to 24 in all the five directions. No solution is possible with ten consecutive numbers ,but you can use any whole numbers you like.



Booster Round

1.

What disappears as soon as you say its name?

2.

If 5 + 3 = 28, 6 + 4 = 210, and 7 + 2 = 59, then what is 8 + 5?

3.

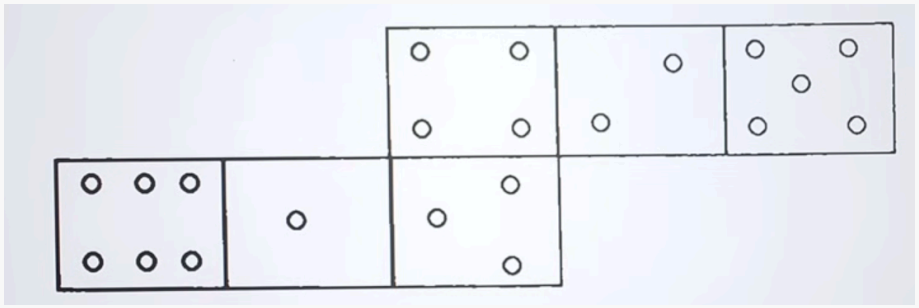
Can you name the biggest number that can be written with two 1's and two 0's ?

4.

Can you make 2 squares and 4 symmetrical right-angled triangles using only 8 straight lines?

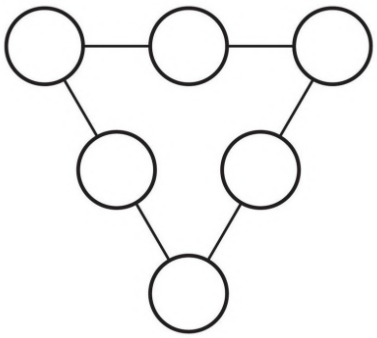
5.

How many dots lie opposite to the face having three dots. When the given figure folded to form a cube?



6.

You have six numbers: 3, 5, 7, 9, 11 and 13. You must place them in the triangle in such a way that the three numbers on each side add up to 25.



7.

What is the 504th digit of the series in which natural numbers are written in order i.e., 1234567891011121314…?

8.

Imagine four coins in a row, all tails up.

Now turn the far left-hand coin over.
Now turn the far right-hand coin over.
Now move the inside coins to the outside.
Now move the second coin in from the left out to the left-hand edge of the row.
Now turn both the inner coins over.
What have you got left?

9.

Imagine that you have 26 constants, labeled A through Z. Each constant is assigned a value in the following way: A = 26^1, B = 25^2, C = 24^3, D = 23^4 and so on till Z = 1^26. Find the exact numerical value to the following equation: (Y - A) * (Y - B) * (Y - C) * ... * (Y - Z).

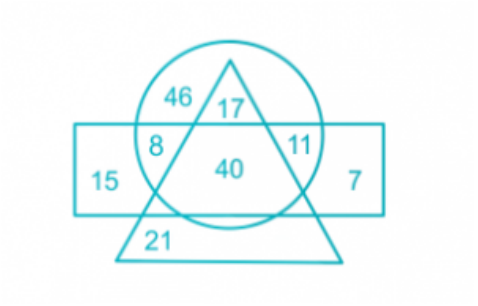
10.

Consider the below operations.

a=4;
b=8;
a=a+10;
b= b/2;
c= a+b;
The value of a,b and c was found out to be 14, 4, and 18 respectively.
a=4;
b=32;
a=a+11;
c=a/2 + b/4;
b= b/2;
The value of a,b and c was found out to be 15, 16, and 15 respectively.
Now
p=13;
q=4;
p=p-1;
q= q+2;
r= p/q + 8;
p= r - q + p;
Find the value of p,q and r respectively.
Write answer in this form-
p= ____
q=_____
r=_____

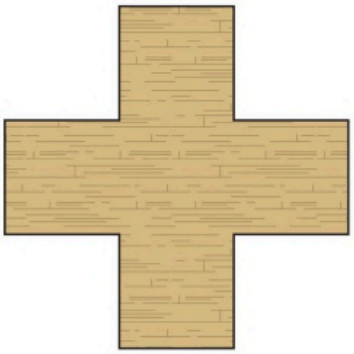
11.

In the given Venn diagram, the circle represents 'PhD students', the triangle represents 'science students' and the rectangle represents 'girls'. The numbers given in the shapes represent the number of persons of that particular category. How many girls are PhD students but are NOT science students?



12.

Using only four straight cuts, how can you divide this cross into five pieces that can be rearranged into a square?



13.

It is a small town railway station and there are 25 station on that line. At each of the railway station passengers can get tickets for any of the other 24 stations. How many different kinds of tickets do you think the booking clerk has to keep?

14.

What number continues this sequence?

15.

Start in the bottom left corner and move either up or right, one square at a time, using the numbers and the mathematical signs along the way. What is the largest total you can make?

+	2	−	4	+	2
2	+	2	−	2	+
−	1	+	3	−	3
2	−	3	+	1	−
+	1	−	3	+	2
3	+	3	−	2	+

16.

How many people are “two pairs of twins twice”?

17.

Plug in either addition (+), subtraction (-), multiplication (x), division (/) and parenthesis among five number 7s to make a target result number 50, you can use same operator multiple times.

7 7 7 7 7 = 50

18.

A group of 5 people want to keep their secret document in a safe. They want to make sure that in future, only a majority (>=3) can open the safe. So they want to put some locks on the safe, each of the locks have to be opened to access the safe. Each lock can have multiple keys; but each key only opens one lock. How many locks are required at the minimum? How many keys will each member carry?

19.

A man runs ‘n’ times round a circular track whose radius is ‘t’ miles. He drinks ‘s’ quarts of beer for every mile that he runs.

Use your pronounciation skills to prove that he will only need one quart.

(Given : 10 pints = 5 quarts)

20.

An officer wished to form his men into twelve rows, with eleven men in every row, so that he could place himself at a point that would be equidistant every that he could place himself at a point that would be equidistant from every row. "But there are only one hundred and twenty of us, sir," said one of the men. Was it possible to carry out the order ? If yes, then make a diagram to illustrate your answer.

IQ GAME Round

1.

Sudoku

Given below is a 9×9 grid divided into nine 3×3 subgrids.
Somes cells are pre-filled with numbers — these are called "givens" and cannot be changed.
Use numbers 1 to 9.
Each row must have all digits 1–9 with no repeats.
Each column must have all digits 1–9 with no repeats.
Each 3×3 box must have all digits 1–9 with no repeats.

SUDOKU 1

5	**9**				**4**			
		6	**3**			**5**	**1**	
					8	**9**		
	7							**3**
3	**5**		**4**		**7**		**9**	**1**
9							**7**	
		5	**1**					
	8	**7**			**6**	**1**		
			5				**6**	**8**

OR

2.

The Prisoner Hat Riddle
Scenario:
You and 4 other participants are blindfolded and lined up on a staircase, all facing forward. Each person can see the people in front of them but not behind. So:

Person 1 (front) sees nobody.
Person 2 sees Person 1.
Person 3 sees Persons 1 and 2.
Person 4 sees Persons 1, 2, and 3.
Person 5 (back) sees Persons 1 to 4.

Each of you is wearing a hat that is either red or blue, chosen at random. You don't know your own hat color, but the people behind you can see the hats in front.

Starting with Person 5 (the back), each person must say "red" or "blue" out loud, guessing their own hat color. No other communication is allowed, and no one can turn around. If you guess wrong, you're eliminated. The goal is to maximize the number of survivors.

What strategy should the group agree on in advance to guarantee that at least 4 people survive, regardless of the hat arrangement? Explain how the strategy works.

OR

3.

Code Harmonization Challenge

You are provided with the encoded sequence, represented by the following integers:
16, 22, 27, 27, 13, 6, 19, 2, 4, 6, 2025

Aarav, a fan of aesthetic uniformity, is dissatisfied with the apparent randomness of the sequence.To resolve this, he requests his friend Om to transform all the numbers in the list to a single common value.

To make this process intellectually stimulating, Nidhi introduces the following operation:
In a single move, you may select any two numbers from the list, compute their HCF (Highest Common Factor), and replace one of the two numbers with this HCF (while keeping the other unchanged).

Om, being intelligent but lazy, seeks to minimize the total number of such moves required to make all elements of the list equal.
Objective:

Devise and describe the optimal sequence of operations (i.e., which pairs to choose and which element to replace in each step) that Om should perform to achieve this goal in as few moves as possible.
Illustrative Example:
Given an initial sequence:
12, 20, 30
Step 1: Choose (20, 30) → HCF = 10 → Replace 30 with 10 → [12, 20, 10]
Step 2: Choose (12, 10) → HCF = 2 → Replace 12 with 2 → [2, 20, 10]
Step 3: Choose (2, 20) → HCF = 2 → Replace 20 with 2 → [2, 2, 10]
Step 4: Choose (2, 10) → HCF = 2 → Replace 10 with 2 → [2, 2, 2]
Total moves = 4
You are now required to apply this logic to the given sequence and determine the minimum number of operations Om must perform, along with the optimal steps.

Senior Group (IX-X)

ANSWER KEY

QUALIFIER 1 .

ANSWER- (6457 , 7645) OR (6,457) both are correct.

ROUND A

A1. 15

A2. Shirt or t-shirts

A3. man in the photograph is Ramesh's nephew

A4. 2

A5. Five minutes.

A6. A

A7. NMKOYE

A8. 47 days

A9. 30 min

A10. 5

QUALIFIER 2

ANSWER - 24

ROUND B

B1. 20 cubes

B2. Ruhi & Tina

B3. 4000 miles

B4. The woman was a photographer.

B5. 2 × 4 × 6 ÷ 8 = 6 and 2 x 4 + 6 - 8 = 6. If BOTH of these solutions are written only then it will be considered as correct.

B6. A

B7. 5

B8. 117

B9. 65292

B10. Never

QUALIFIER 3

ANSWER- 888 + 88 + 8 + 8 + 8(same numbers in any order) = 1,000

ROUND C

C1. When it is 9 a.m., adding 5 hours would make it 2 p.m.

C2. 1:2

C3. Option: 2,3,4

C4. (c)

C5. 48

C6. 61:59

C7. 35

C8. 2

C9. Number is 10 and 6.

C10. The answer is **99 33 44 66 77 88 66 44.**

QUALIFIER 4

ANSWER- 0

ROUND D

D1. Add 'x' between ninety and eight.
[Ninety x Eight = 720]

D2. There are two. {l=b=4; l=6,b=3}

D3. 6 steps

D4. P=3.5,S=3.5,Q=4.5,R=9.5

D5. “38.80”

D6. 6 signs

D7. SKIPPED

D8. 27

D9. Clustor I costs Rs 120 and Clustor IV costs Rs 1710.

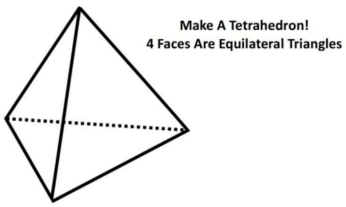
D10. 3,3 and 8

QUALIFIER 5

ANSWER- 5

ROUND E

E1. 10



Edges = 6
Faces = 4
6+4=10

E2. 11

E3. L is the granddaughter of O and there are 4 males.

E4. 12 rungs

E5. 2

E6. Correct answer - “(9801 or 1089)”

E7. Taking wolf on other side will leave goat and cabbage together. Also taking away cabbage will make wolf and goat be alone. Hence, the **farmer will first take goat on the other side and return back alone.** We have farmer, wolf, and cabbage at one side and goat on the other side. Now, **he will take the wolf along, drop the wolf on the other side and return with the goat.** So now on one side, we have farmer, cabbage, and goat and on the other side, we have a wolf. Now, **he takes the cabbage along and returns alone.** So now the scenario is: farmer, goat on one side and wolf, cabbage on the other side. Now, finally, **he crosses the river with the goat and hence succeeds in taking all his belongings with him.**

E8. 2 cuts

E9. “ amounts are exactly same”

E10. 23 DAYS

QUALIFIER 6

ANSWER- G should go to the first group. I should go to the last group.

ROUND F

F1. 1

F2. Bamla and Damla are honest

F3. “042”

F4. 17 minutes

F5. Turn on the first switch and leave it on for 5 minutes. Then turn it off. Now turn on the second switch and immediately go inside the room.

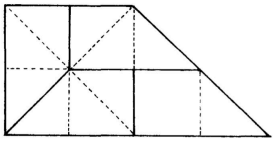
If the bulb is on, it's the second switch.

If the bulb is off but warm, it's the first switch (it was on for a while, then turned off).

If the bulb is off and cold, it's the third switch (which was never touched).

This way, you can identify the correct switch in just one check.

F6.



F7. “31”

F8. Arrange the figures in following way:

173+4=177

85+92=177

Both sums add up alike. More such solutions are possible.

F9. “ **Power of 2 from 0 to 9 in each bag**”

F10. You are given a five-pointed star with 10 circles—one at each point and one at each intersection.

You must place a different number in every circle (no repetitions) so that every straight line of four connected circles adds up to 24.

It is also mentioned:

> No solution is possible with 10 consecutive numbers, but you can use any whole numbers you like.

Step-by-Step Strategy:

1. Understand the structure:

There are 5 lines, each with 4 circles.

Each line must sum to 24.

That gives us 5 × 24 = 120 as the total sum of all line values.

2. But since each circle is part of two lines, the total sum of all individual values should be:

Total of circle values = 120/2 = 60

Trial Solution:

We want 10 distinct numbers adding up to 60.

Let’s try these values:

1, 2, 3, 4, 5, 6, 7, 8, 9, 15 (Sum = 60)

After testing various configurations, one known valid solution (verified) is

Let’s refine it to use 10 unique numbers:

Try:

Numbers: 1, 2, 3, 4, 5, 6, 7, 8, 9, 15

Place

A = 1

B = 9

C = 6

D = 8

E = 2

F = 5

G = 7

H = 4

I = 3

J = 15
Let's test the lines:
1. A + B + C + D = 1 + 9 + 6 + 8 = 24
2. A + E + G + J = 1 + 2 + 7 + 14 = 24
3. B + F + H + E = 9 + 5 + 4 + 6 = 24
4. C + F + I + G = 6 + 5 + 3 + 10 = 24
5. D + H + I + J = 8 + 4 + 3 + 9 = 24
All lines = 24 and numbers are distinct.

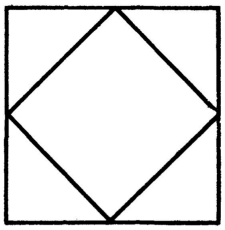
BOOSTER ROUND

1. Silence

2. 313

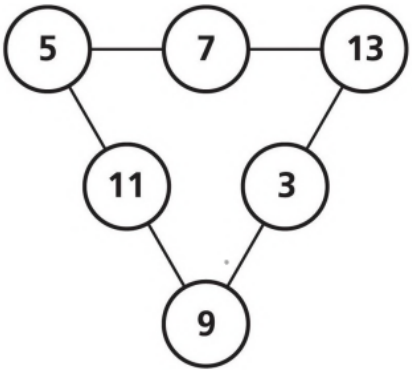
3. 10^{10}

4.



5. 6

6.
This is one solution. You might have come to the same result slightly differently by Rotations/Mirror. **All of them are considered correct if they are satisfying the criteria.**



7. 4

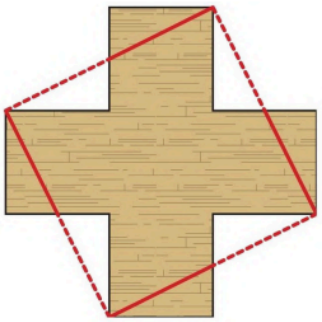
8. H H T T

9. zero

10. p=16
q=6
r=10

11. 19

12.



13. 600

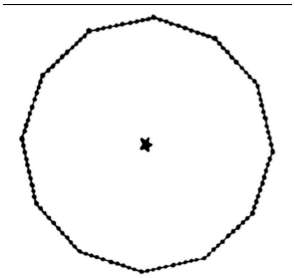
14. 115

15. 7
16. 8

17. ((7 x 7 x 7) + 7) / 7= 50 OR ((7 / 7) / 7 +7) x 7 = 50
18. 10 locks and 6 keys

19. As the radius is t, the diameter is 2t. The diameter multiplied by π (the Greek letter pi) gives us the circumference, 2πt miles. As he goes round n times, 2tπn equals the number of miles run, and, as he drinks s quarts per mile, he consumes 2tπns quarts. We can put the factors in any order: therefore the answer is 2πnts (two pints) or one quart.

20.



The illustration shows the supremely easy way of solving this puzzle. The central star is the officer, and the dots are the men.

IQ GAME ROUND

1.

5	9	2	7	1	4	3	8	6
8	4	6	3	2	9	5	1	7
7	1	3	6	5	8	9	4	2
6	7	4	2	9	1	8	5	3
3	5	8	4	6	7	2	9	1
9	2	1	8	3	5	6	7	4
4	6	5	1	8	3	7	2	9
2	8	7	9	4	6	1	3	5
1	3	9	5	7	2	4	6	8

2.

Developing a strategy that allows at least 4 people to survive, regardless of hat arrangement.

The Key Insight:

Use parity (even/odd count) of one color (e.g., red) as a shared code.

The Strategy:

Before the challenge starts, all 5 participants agree on this:

The last person (Person 5) will use their answer to convey the parity of red hats they see (even or odd).

Everyone else will use that information, plus what they can see, to deduce their own hat color.

🔢 Step-by-step Strategy:

1. Person 5 (Sees 4 hats):

Count how many red hats are in front.

If that number is even, say "red".

If it's odd, say "blue".

This person has a 50% chance of surviving, but their answer is a code to help others.

2. Person 4 (Sees 3 hats):

Person 4 knows what Person 5 said ("red" = even, "blue" = odd).

They count how many red hats are in front (Persons 1–3).

Using what they see, and what Person 5 said, they deduce whether their own hat must be red or blue to maintain the parity.

> Example:

Person 5 says "red" = sees even red hats.

Person 4 sees 2 red hats → parity is even.

So their hat must be blue to keep total even → they say "blue".

3. Person 3, 2, and 1:

Each applies the same logic:

They know the intended parity from Person 5.

They know what others behind them have said.

They see the hats in front.

They deduce their own hat color to preserve the expected parity.

Why This Works:

Person 5 might guess wrong (50/50), but they encode critical parity information.

Person 4 onward has enough information to deduce their own hat color with certainty.

So, at most 1 person dies.

Result:

At least 4 people survive, always.This is the best possible strategy.

3.

First note that the equal numbers can be the HCF of all the numbers only. For the given sequence, the HCF of all the numbers is 1. Thus we will try to make all of them equal to 1 in minimum possible moves.

For this, Note that, in each move at most one number can become 1.

Thus **at least 11 (length of given sequence) operations are required.**

We will show that this is in fact possible.

First choose 2 and 2025. Its HCF is 1. Replace 2 with 1. Thus, the sequence now includes 1. We know HCF of 1 with any number is also 1. Hence, we will select in each step, a number other than 1 and 1. example, in second step choose 16 and 1. And Replace 16 with 1. Keep doing this until all numbers are 1. Total number of steps required is 11.

Step 1: Choose the pair (2, 2025). Their HCF is 1. Replace 2 with 1.
→ The sequence now contains a 1.

Steps 2 to 11: In each subsequent step, select any number not yet equal to 1, and pair it with 1. Since the HCF of 1 and any integer is 1, replacing the selected number with the HCF will convert it to 1.