

# Questions

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## 1. Treasure room(Analytical skills)

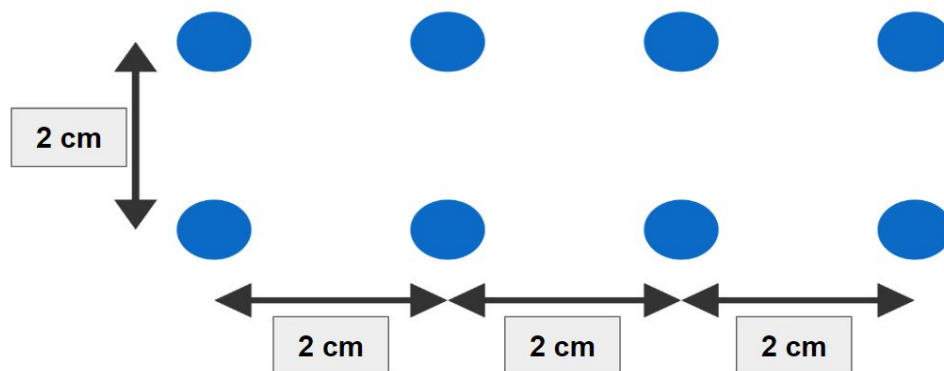
While working on a case Sherlock Holmes comes across a treasure box which has the pattern shown in the picture inscribed on it. As he lifts the box he gets locked in the room and finds a pen and following instructions below the treasure box. The instructions say if you can join the points and satisfy the following conditions the door will open and you can leave with the treasure box.

- The pen can only draw a 13 cm long line.
- All points need to be joined to at least one other point.
- If you start moving on the line from one point you should be able to reach any other point.

Sherlock, being the smartest detective connects all the dots satisfying all the conditions and still has some ink left in his pen. What is the length of the line which can be drawn with that pen with the ink left?

**Multiply the answer by 10 and shade the corresponding bubble in the O.M.R.**

( $\sqrt{3} = 1.7$ )



## 2. Match Fixing(Discrete maths)

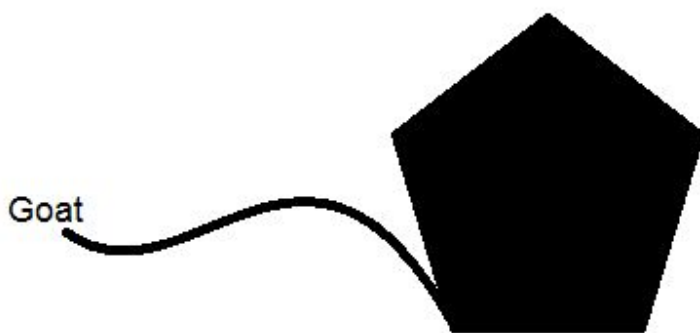
King Krishnadevaraya and Tenali Raman are sitting in the royal courtyard. Krishnadevaraya sees a pile of stones and comes up with a fair game to play with Tenali Raman. He thinks for some time and decides on following rules.

1. A player can remove 1, 2 or 4 stones from the pile in a turn.
2. A player who removes the last stone from the pile loses.
3. The first player to play will decide the number of stones in the pile.

Tenali Raman immediately notices a way to please the king by letting him win every single time. He asks the king to let him play first and comes up the number of stones in the pile which guarantee his loss. He quickly notices that all the number of stones which will guarantee his loss are in Arithmetic Progression (if written in ascending order difference between any two consecutive numbers is constant).

**Mark the common difference of the arithmetic progression as your answer.**

## 3. Goat queries!!(Geometry)



According to a report, Mirzapur in Uttar Pradesh is the most notorious city in the world for the crime. Rohith, the farmer is a local living there and he earns his living by selling milk. He is therefore very careful not to leave his goats alone. He ties a goat to the corner of a pentagon-shaped field with a rope of length 7 units. Each side of the field is of length 3 units.

Find the maximum area of the field accessible to the goat for grazing. ( Use  $\pi = 3$  ).

**Round off the obtained number to the nearest integer and give the remainder obtained when the number is divided by 10.**

#### 4. Magic Number(analytical reasoning)

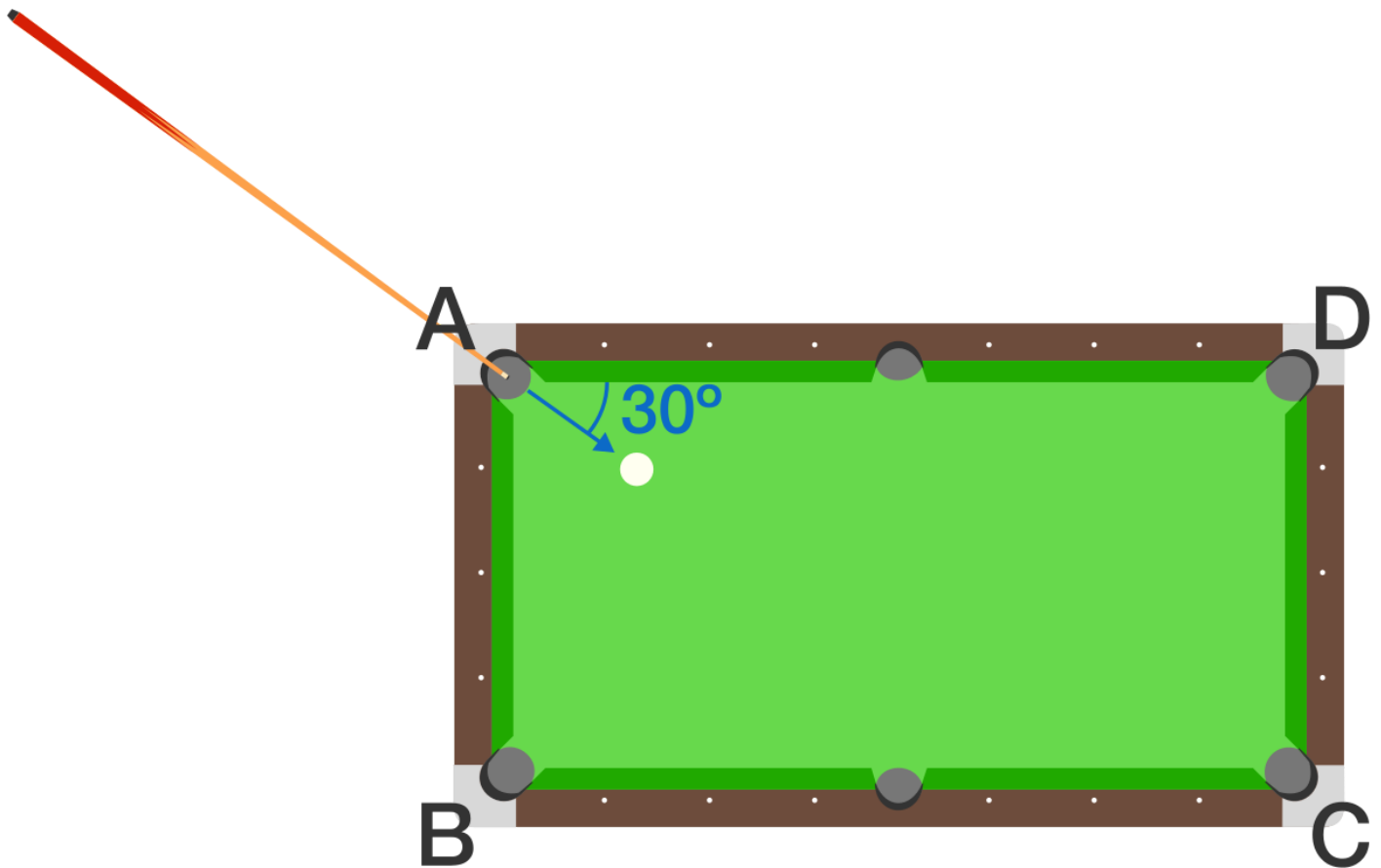
Langdon Finally got hold of the cryptic message which will lead him to the holy grail. But whoops! Old Sauniere has set a puzzle for him to solve. He has to find the smallest number such that

- A. When it is divided it by 2, the remainder is 1
- B. When it is divided it by 3, the remainder is 2
- C. When it is divided by 4, the remainder is 3
- D. When it is divided by 5, the remainder is 4
- E. When it is divided by 6, the remainder is 5
- F. When it is divided by 7, the remainder is 6
- G. When it is divided by 8, the remainder is 7
- H. When it is divided by 9, the remainder is 8

It's not a small number, but it's not really big, either!!! Help him in his quest for the famed chalice.

**Give the remainder when the number is divided by 10.**

## 5. The Pocket Ball(Geometry)



Mario brothers Mario and Luigi are playing a game of billiards. Mario challenges Luigi to predict the pocket into which the ball will go after he takes the shot.

On the given billiard table ABCD with integer side lengths, Mario shoots from point A at an angle of  $30^\circ$  with side AD.

Help Luigi to find out the pocket into which the ball will fall.

**Give the index of the letter representing the hole as the answer.**

Index of A is 1, B is 2, C is 3, D is 4. 0 represents the case when the ball does not go into any of the holes.

The ball falls only when the center of the ball and the corner pocket exactly match. Also, disregard any friction or air resistance.

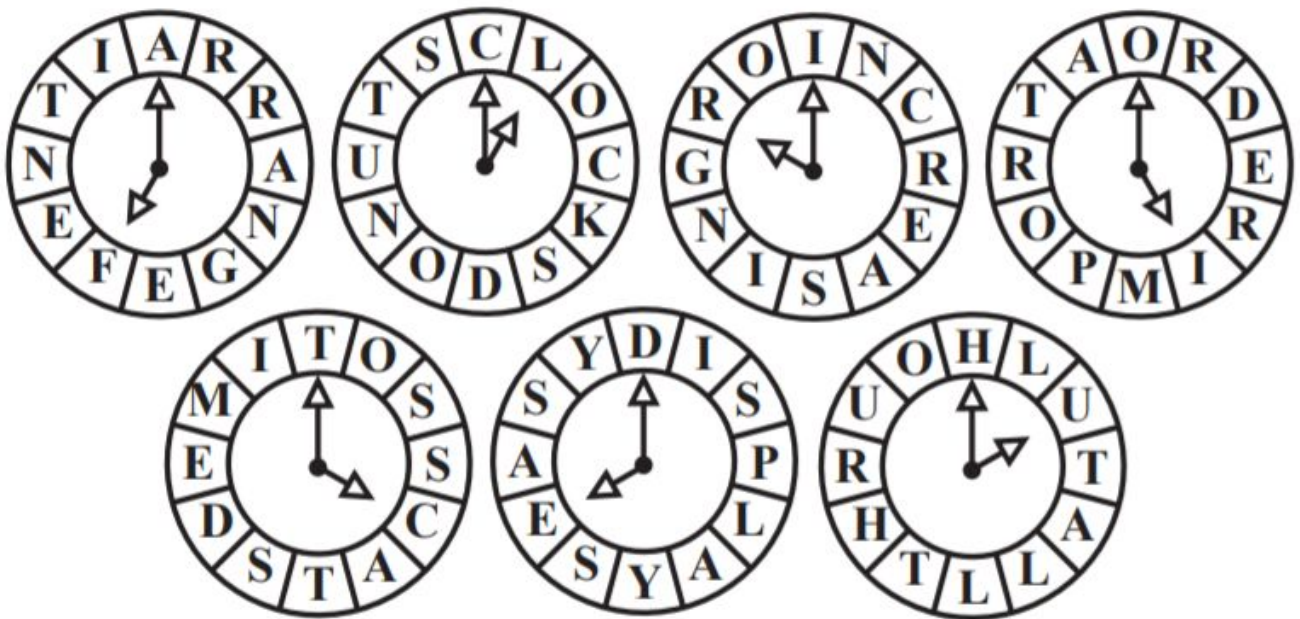
## 6. Sacred Games(Logical reasoning)

One archeologist while researching near Tirupati finds an ancient temple. He enters the grand old temple mesmerized by its beauty and spends hours closely observing the temple. In a corner, he stumbles upon an engraving which read,

*"You start reading when, Begin the night or day then, Around the clock you read time, And the secret to out climb"*

He saw stairs going upwards with stone keys below them, for typing the password to the second floor. What is the password?

**Give the remainder of the sum of indexes of all the letters of the password when divided by 10 as the answer. index of A is 1, B is 2 and so on.**



## 7. Perplexing Potential Prisoners(Verbal Reasoning)

A robbery has been committed by a criminal and an accomplice. You have gathered 6 possible suspects: 4 innocent citizens, the criminal, and the accomplice. The citizens will always tell the truth, and the seasoned criminal will also tell the truth as their experience will cause them to play it safe in case of any lie detector sensors. However, the inexperienced accomplice will always lie to try to cover themselves. You have intelligence that the accomplice is innocent and was forced into it by the criminal, so you are more interested in the criminal, but the accomplice does not know this and will still lie out of fear of being caught.) Assume that all of the suspects know who is who.

Aaron, Brendan, Cynthia, Derek, Esther, and Fabio all stand in a line in *alphabetical order* and say the following:

- Aaron: "I'm a citizen."
- Brendan: "Cynthia and I didn't perform the robbery together."
- Cynthia: "Brendan is a citizen."
- Derek: "The criminal and the accomplice are standing next to each other."
- Esther: "The criminal is Aaron, Cynthia, or Fabio."
- Fabio: "I'm not the murderer."

**Who is the criminal? Give the index of the starting letter of the name as the answer.**

**(The counting begins from 1,i.e A is 1, B is 2,etc.)**

## 8. Fruity Guesses(Verbal Reasoning)

In a contest, four fruits (an apple, a banana, an orange, and a pear) have been placed in four closed boxes (one fruit per box). People may guess which fruit is in which box. 123 people participate in the contest. When the boxes are opened, it turns out that

43 people have guessed none of the fruits correctly,

39 people have guessed one fruit correctly, and

31 people have guessed two fruits correctly.

**How many people guessed three fruits correctly, and how many people guessed four fruits correctly? Give the remainder when this number is divided by 8.**

## 9. Messing with philosophers(Verbal reasoning)

Three philosophers A, B and C decided to play a game. The first philosopher thought of two consecutive numbers between 1 and 10 and told one number to each of the other two philosophers. Then B and C had a conversation.

B: I don't know your number.

C: Neither do I know your number.

B: Now I know your number.

**Let X be the sum of possible values of C's number. What is  $(X+5)/2$ ?**

## 10. Hack the Code(Analytical skills)

Master Shifu challenges Po to decode pattern as a part of his training program. Let X be the sum of elements of the next row of the number pyramid shown below.

Help Po **find the value of  $X/2$ .**

1

1 1

2 1

1 2 1 1

1 1 1 2 2 1

## 11. Finger Explosion(Analytical skills)

The Earth has a population of 7.6 billion.

**What would be the rightmost digit of the result, if you multiply together the number of fingers on every person's left hands? (For the purposes of this exercise, thumbs count as fingers).**

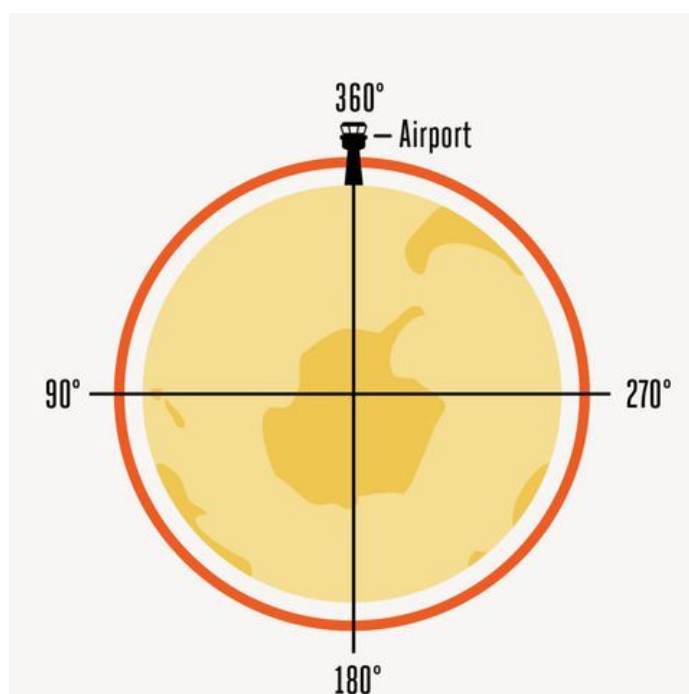
## 12.(Geometry) Around The World In Eighty Days

You have built 3 identical planes that can go around the Earth. Assuming the Equator to be a perfect circle,

- The planes can cover 1-degree longitude using 1 liter of fuel.
- The fuel tank has a capacity of 180 liters. You will fly one plane,
- Your assistants A & B will fly the other two planes.
- The 3 planes are capable of instantaneous fuel transfers from one plane to another in midair.
- They can also change direction instantaneously.
- The Equator has only one airport, from which all takeoffs and landings can occur. On-ground refueling can occur only at that airport.
- The speeds of all three planes are 2 degrees longitude per minute.

How do you ensure that your plane completes one revolution around the Earth's Equator, with none of the planes running out of fuel mid-air?

**Give the total angular distance traveled by the 3 planes in degrees, divided by 180.**





### 13. Bro Deals(Analytical skills)

Two brothers each have an equal stake in a dairy farm, but after the price of milk drops, they decide to go their separate ways and start raising lambs instead. The brothers sell off their cows and sell each cow for as many rupees as they have cows. They use that money to buy lambs for ₹10 apiece. Once they have purchased as many lambs as they can with the money from the selling cows, they have a little left over, which they use to buy a kid goat.

The two brothers now have purchased an even number of animals. They split the animals evenly, but the brother who gets the kid goat wants a sum of money from the brother who gets all lambs to equalize the value.

**How much money in rupee should the brother with the goat receive?**

### 14. Jars and tablets(Logical reasoning)

Two friends are pondering over a problem. There are 5 identical unmarked jars, each containing exactly 1024 tablets. 4 jars have tablets weighing 10 grams each, while 1 jar has tablets weighing 9 grams each. You are only allowed one use of a weighing machine to weigh a minimum number of tablets  $N$  to find the jar with the 9-gram tablets.

**Give  $(N+1)/2$ ?**

### 15. The track that Fly!!(Relative velocity)

Two cyclists are at a distance of 30 km from each other. The instant they start cycling towards each other at the speed of 15 km/h. A fly sitting on the handlebar of one cycle starts moving towards the other cycle at a speed of 20 km/h. It then sits on the handlebar of the other cycle before flying back to the other cycle. It then flies back to the second cycle, and so on, until both cyclists cross each other. The total distance traveled by the fly is  $D$  (in km).

**Find  $D$ -15.**