Difficult Logic Problems

Very Easy - Easy - Difficult - Very Difficult

Print Problems
Print Solutions

Hide All
Show All

Site Map

Send Feedback

Discussion Board

1. The Most Intelligent Prince

A king wants his daughter to marry the smartest of 3 extremely intelligent young princes, and so the king's wise men devised an intelligence test.

The princes are gathered into a room and seated, facing one another, and are shown 2 black hats and 3 white hats. They are blindfolded, and 1 hat is placed on each of their heads, with the remaining hats hidden in a different room.

The king tells them that the first prince to deduce the color of his hat without removing it or looking at it will marry his daughter. A wrong guess will mean death. The blindfolds are then removed.

You are one of the princes. You see 2 white hats on the other prince's heads. After some time you realize that the other prince's are unable to deduce the color of their hat, or are unwilling to guess. What color is your hat?

Note: You know that your competitors are very intelligent and want nothing more than to marry the princess. You also know that the king is a man of his word, and he has said that the test is a fair test of intelligence and bravery.

Show Hint Show Solution View 51 comments

Hint: Based on what you know, why are the other princes unable to solve this puzzle?

Answer: White.

The king would not select two white hats and one black hat. This would mean two princes would see one black hat and one white hat. You would be at a disadvantage if you were the only prince wearing a black hat.

If you were wearing the black hat, it would not take long for one of the other princes to deduce he was wearing a white hat.

If an intelligent prince saw a white hat and a black hat, he would eventually realize that the king would never select two black hats and one white hat. Any prince seeing two black hats would instantly know he was wearing a white hat. Therefore if a prince can see one black hat, he can work out he is wearing white.

Therefore the only fair test is for all three princes to be wearing white hats. After waiting some time just to be sure, you can safely assert you are wearing a white hat.

2. 100 Gold Coins

Five pirates have obtained 100 gold coins and have to divide up the loot. The pirates are all extremely intelligent, treacherous and selfish (especially the captain).

The captain always proposes a distribution of the loot. All pirates vote on the

proposal, and if half the crew or more go "Aye", the loot is divided as proposed, as no pirate would be willing to take on the captain without superior force on their side.

If the captain fails to obtain support of at least half his crew (which includes himself), he faces a mutiny, and all pirates will turn against him and make him walk the plank. The pirates start over again with the next senior pirate as captain.

What is the maximum number of coins the captain can keep without risking his life?

Solved by **14%** within 11 minutes.

Guess **Show Hint** **Show Solution** **View 23 comments**

Hint: What happens if there are two pirates? Who completely loses out? What happens if there are three pirates? Who completely loses out? What happens if there are four pirates? Which two pirates completely lose out?

Answer: 98

The captain says he will take 98 coins, and will give one coin to the third most senior pirate and another coin to the most junior pirate. He then explains his decision in a manner like this...

If there were 2 pirates, pirate 2 being the most senior, he would just vote for himself and that would be 50% of the vote, so he's obviously going to keep all the money for himself.

If there were 3 pirates, pirate 3 has to convince at least one other person to join in his plan. Pirate 3 would take 99 gold coins and give 1 coin to pirate 1. Pirate 1 knows if he does not vote for pirate 3, then he gets nothing, so obviously is going to vote for this plan.

If there were 4 pirates, pirate 4 would give 1 coin to pirate 2, and pirate 2 knows if he does not vote for pirate 4, then he gets nothing, so obviously is going to vote for this plan.

As there are 5 pirates, pirates 1 & 3 had obviously better vote for the captain, or they face choosing nothing or risking death.

3. 1 Gold Coin

The five pirates mentioned previously are joined by a sixth, then plunder a ship with only one gold coin.

After venting some of their frustration by killing all on board the ship, they now need to divvy up the one coin. They are so angry, they now value in priority order:
1. Their lives
2. Getting money
3. Seeing other pirates die.

So if given the choice between two outcomes, in which they get the same amount of money, they'd choose the outcome where they get to see more of the other pirates die.

How can the captain save his skin?

Show Hint Show Solution View 8 comments

Hint: Use the same approach.

Answer: The most senior pirate could give the coin to the least senior pirate. He can use the same logic in the previous puzzle to explain the futility of anyone trying to keep the coin for himself.

---

4. The Greek Philosophers

One day three Greek philosophers settled under the shade of an olive tree, opened a bottle of Retsina, and began a lengthy discussion of the Fundamental Ontological Question: Why does anything exist?

After a while, they began to ramble. Then, one by one, they fell asleep.

While the men slept, three owls, one above each philosopher, completed their digestive process, dropped a present on each philosopher's forehead, the flew off with a noisy "hoot."

Perhaps the hoot awakened the philosophers. As soon as they looked at each other, all three began, simultaneously, to laugh. Then, one of them abruptly stopped laughing. Why?

Show Hint Show Solution View 10 comments

Hint: The one who stopped laughing, asked himself what the other philosophers were seeing that made them laugh.

Answer: If he (the smartest philosopher) had nothing on his head, then he realized that the second smartest philosopher would have quickly worked out that the third smartest was laughing only at the second smartest philosopher, and thus the second smartest philosopher would have stopped laughing.

---

5. The 100 Coins

There are 10 sets of 10 coins. You know how much the coins should weigh. You know all the coins in one set of ten are exactly a hundredth of an ounce off, making the entire set of ten coins a tenth of an ounce off. You also know that all the other coins weight the correct amount. You are allowed to use an extremely accurate digital weighing machine only once.

How do you determine which set of 10 coins is faulty?

Show Hint Show Solution View 4 comments

Hint: You can weigh as few or as many of the ten coins from each set as you choose.

Answer: Weigh one of the first, two of the second, three of the third etc... If the weight is off by one hundredth of an ounce then it is the first set, if the weight is off by two hundred of an ounce then it is the second set, etc...

6. The Monkey and the Coconut

Ten people land on a deserted island. There they find lots of coconuts and a monkey. During their first day they gather coconuts and put them all in a community pile. After working all day they decide to sleep and divide them into ten equal piles the next morning.

That night one castaway wakes up hungry and decides to take his share early. After dividing up the coconuts he finds he is one coconut short of ten equal piles. He also notices the monkey holding one more coconut. So he tries to take the monkey's coconut to have a total evenly divisible by 10. However when he tries to take it the monkey conks him on the head with it and kills him.

Later another castaway wakes up hungry and decides to take his share early. On the way to the coconuts he finds the body of the first castaway, which pleases him because he will now be entitled to 1/9 of the total pile. After dividing them up into nine piles he is again one coconut short and tries to take the monkey's slightly bloodied coconut. The monkey conks the second man on the head and kills him.

One by one each of the remaining castaways goes through the same process, until the 10th person to wake up gets the entire pile for himself. What is the smallest number of possible coconuts in the pile, not counting the monkeys?

Solved by **19%** within 11 minutes.

Guess **Show Hint** **Show Solution** **View 16 comments**

Hint: Look up the formula for the LCM.

Answer: 2519

The solution for the answer is the LCM (Lowest Common Multiple) of 10,9,8,7,6,5,4,3,2,1 -1. LCM would give the least number which is divisible by all of these number and subtracting one would give us the number of coconuts which were initially there.

Very Easy - **Easy** - **Difficult** - **Very Difficult**

Questions or Comments: Send