Problem:

You have seven bags of gold coins. Each bag has the same number of gold coins. One day, you find a bag of 53 coins. You decide to redistribute the number of coins you have so that all eight bags you hold have the same number of coins. You successfully manage to redistribute all the coins, and you also note that you have more than 200 coins. What is the smallest number of

Response:

Let's denote the number of gold coins in each of the seven bags initially as \\(x \\). Therefore, the total number of coins initially is \\(7x \\). After finding a bag of 53 coins, the total number of coins becomes \\(7x + 53 \\). [score=0.98]

We are given that the total number of coins can be evenly distributed among 8 bags, so \\(7x + 53 \\) must be divisible by 8. Additionally, we know that the total number of coins is more than 200. We need to find the smallest possible value of \\(7x + 53 \\) that satisfies both conditions. [score=0.95]

First, we express the condition that \\(7x + 53 \\) is divisible by 8:\n\\[7x + 53 \\equiv 0 \\pmod{8} \\]\nSince \\(7 \\equiv -1 \\pmod{8} \\), we can rewrite the equation as:\n\\[-x + 53 \\equiv 0 \\pmod{8} \\]\n\\[-x \\equiv -53 \\pmod{8} \\]\n\\[x \\equiv 53 \\pmod{8} \\]\n\\[x \\equiv 5 \\pmod{8} \\]\nThis means that \\(x \\) can be written in the form:\n\\[x = 8k + 5 \\]\nfor some integer \\(k \\). [score=0.90]

Next, we substitute \\(x = 8k + 5 \\) into the expression for the total number of coins:\n\\[7x + 53 = 7(8k + 5) + 53 = 56k + 35 + 53 = 56k + 88 \\]\nWe need \\(56k + 88 \\) to be more than 200:\n\\[56k + 88 > 200 \\]\n\\[56k > 112 \\]\n\\[k > 2 \\]\nThe smallest integer \\(k \\) that satisfies this inequality is \\(k = 3 \\). Substituting \\(k = 3 \\) into the expression for the total number of coins, we get:\n\\[56 \\cdot 3 + 88 = 168 + 88 = 256 \\]\nThus, the smallest number of coins you could have had before finding the bag of 53 coins is:\n\\[7x = 7(8 \\cdot 3 + 5) = 7 \\cdot 29 = 203 \\]\nTherefore, the smallest number of coins you could have had before finding the bag of 53 coins is \\(\\boxed{203}\\). [score=0.12] [token num=283]