**#Solution-1.**

Yes, the right-hand side of the equation is a rational number. It can be expressed as a ratio of two integers by simplifying the fraction.

The right-hand side of the equation is:

(1 - 1/2^(n+1)) / (1 - 1/2)

We can simplify this fraction by multiplying both the numerator and the denominator by 2^(n+1). This gives us:

(2^(n+1) - 1) / (2^(n+1) - 1)

This fraction is equal to 1, so it can be expressed as the ratio of two integers: 1/1 = 1.

**#Solution-2.**

To prove this statement, we can use the following steps:

1. Multiply both sides of the equation 𝑟3𝑥3 + 𝑟2𝑥2 + 𝑟1𝑥+ 𝑟0 = 0 by a suitable integer m to obtain the equation 𝑚𝑟3𝑥3 + 𝑚𝑟2𝑥2 + 𝑚𝑟1𝑥 + 𝑚𝑟0 = 0.
2. Since 𝑟0, 𝑟1, 𝑟2, and 𝑟3 are rational numbers, 𝑚𝑟0, 𝑚𝑟1, 𝑚𝑟2, and 𝑚𝑟3 are also rational numbers.
3. Since m is an integer, 𝑚𝑟0, 𝑚𝑟1, 𝑚𝑟2, and 𝑚𝑟3 are also integers.
4. Therefore, c satisfies the equation 𝑛3𝑥3 + 𝑛2𝑥2 + 𝑛1𝑥+ 𝑛0 = 0, where 𝑛0 = 𝑚𝑟0, 𝑛1 = 𝑚𝑟1, 𝑛2 = 𝑚𝑟2, and 𝑛3 = 𝑚𝑟3 are integers.

**#Solution-3.**

No, the customer will not win $100 because none of the numbers on the card add up to 100. If we add all the possible combinations of two or more numbers on the card, we find that the sum is always less than 100. For example, the sum of 72 and 21 is 93, the sum of 15 and 36 is 51, and the sum of 69 and 81 is 150. None of these combinations add up to 100, so the customer will not win $100.

**#Solution-4.**

Let M be the number of mathematics students at the university and C be the number of computer science students at the university. We know that 2/3M = 3/5C, and M = C.

We can substitute M = C into the first equation to get 2/3C = 3/5C, which simplifies to 2C = 3C. Solving for C, we find that C = 0. However, this solution is not valid because it does not satisfy the condition that there are at least 100 mathematics students at the university.

We can also substitute M = C into the first equation to get 2/3M = 3/5M, which simplifies to 2M = 3M. Solving for M, we find that M = 0. Again, this solution is not valid because it does not satisfy the condition that there are at least 100 mathematics students at the university.

The least possible values for M and C that satisfy the conditions are M = 100 and C = 150. These values satisfy the equation 2/3M = 3/5C, M = C, and M is at least 100.

Therefore, the least possible number of mathematics students at the university is 100, and the least possible number of computer science students at the university is 150.