**#Solution-1**

Suppose n is any non-negative integer

Let y=

=

Multiplying the nominator and denominator, and dividing by , we get

y=

y=

Let p = -1 and q = , then p and q are integers because n is a non-negative integer and ≠ 0.

Thus, y= , for some integer p and q with q ≠ 0

Therefore, y is a rational number.

**#Solution-2.**

To prove the given statement,

Let’s assume that a real number c satisfies a polynomial equation of form

r3x^3 + r2x^2 + r1x + r0 = 0

where r0, r1, r2, and r3 are rational numbers. We want to show that c also satisfies an equation of form n3x^3 + n2x^2 + n1x + n0 = 0 where n0, n1, n2, and n3 are integers.

We can do this by multiplying the given equation by the least common multiple (LCM) of the denominators of the rational coefficients r0, r1, r2, and r3. This will produce an equation with integer coefficients.

For example, suppose the given equation is (2/3)x^3 + (4/5)x^2 + (6/7)x + (8/9) = 0

The LCM of 3, 5, 7, and 9 is 315. Multiplying the given equation by 315, we get (630/3)x^3 + (1260/5)x^2 + (1890/7)x + (2640/9) = 0 This equation can be rewritten as 210x^3 + 252x^2 + 270x + 920 = 0 which is an equation with integer coefficients. Therefore, we have shown that if a real number c satisfies a polynomial equation of the form 𝑟3𝑥3 + 𝑟2𝑥2 + 𝑟1𝑥+ 𝑟0 = 0 where 𝑟0, 𝑟1, 𝑟2, and 𝑟3 are rational numbers, then c also satisfies an equation of the form 𝑛3𝑥3 + 𝑛2𝑥2 + 𝑛1𝑥+ 𝑛0 = 0 where 𝑛0, 𝑛1, 𝑛2, and 𝑛3 are integers.

**#Solution-3.**

None of the numbers on the card add up to 100 so no, the customer will not win $100. When 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, 15 and 36 is 51, and 69 and 81 is 150. None of these combinations add up to 100, so the customer will not win $100.

**#Solution-4.**

Let A be the number of mathematics students at the university and B be the number of computer science students at the university.

We know that,

And, A=B

We can Substitute A = B into the first equation to get , which simplifies to 2B = 3B. Solving for B, we find that B=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.

The least possible values for A and B that satisfy the condition are A = 100 and B= 150. These values satisfy the equation , A=B, and A 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 at the university is 150.