



Problem of the Week

Problem D and Solution

Sharing Beads

Problem

Golriz and Diane each have some beads. If Diane gives six of her beads to Golriz, then Golriz would then have twice as many beads as Diane. Instead, if Diane takes six beads from Golriz, then both would have the same number of the beads. What is the total number of beads that Golriz and Diane have?

Solution

Solution 1

Let d be the number of beads that Diane has, and let g be the number of beads that Golriz has.

If Diane gives 6 beads to Golriz, then Diane would have $d - 6$ beads and Golriz would have $g + 6$ beads. Then Golriz has twice as many beads as Diane, meaning $g + 6 = 2(d - 6)$. Thus, $g = 2d - 18$.

If Diane takes 6 beads from Golriz, then Diane would have $d + 6$ beads and Golriz would have $g - 6$ beads. Then they both would have the same number of beads, meaning $d + 6 = g - 6$. Thus, $g = d + 12$.

Since $g = 2d - 18$ and $g = d + 12$, we have $2d - 18 = d + 12$ or $d = 30$. Thus, $g = d + 12 = 30 + 12 = 42$.

Thus, the total number of beads that Golriz and Diane have is $30 + 42 = 72$.

Solution 2

Let d be the number of beads that Diane has.

If Diane takes 6 beads from Golriz, then the two of them would have the same number of beads. This tells us that Golriz has 12 more beads than Diane, or that Golriz has $d + 12$ beads.

If Diane gives 6 beads to Golriz, then Diane would have $d - 6$ beads and Golriz would have $d + 12 + 6 = d + 18$ beads.

From the given information, $d + 18 = 2(d - 6)$. Solving, we have $d + 18 = 2d - 12$ or $d = 30$.

Thus, Diane has 30 beads and Golriz has $30 + 12 = 42$ beads. Therefore, they have $30 + 42 = 72$ beads in total.