Concept : Guess & check (Using table)

In a farm, there were 50 cows and chickens.
Given that they had a total of 146 legs altogether, how many cows were there?

1) Using a table, we will have a column for the types of animals and the part of the animal which the number is given (the number of legs for this questions) this is how the table will look like at first:

Number of cows	Total cow legs	Number of chickens	Total chicken legs	Total cow & chicken legs	Check

2) The first step is to break the total number of animals (50) into 2.
50 ÷ 2 = 25
So, 25 will go to the cows then the remaining 25 will go to the chickens.

Number of cows	Total cow legs	Number of chickens	Total chicken legs	Total cow & chicken legs	Check
25		25			

3) So if there are 25 cows, how many legs do all the cows have in total?
Since each cow have 4 legs, to find the total we just multiply it
(25 cows x 4 legs = 100 legs)

For the chicken, it will be 25 chickens x 2 legs = 50 legs

Number of cows	Total cow legs	Number of chickens	Total chicken legs	Total cow & chicken legs	Check
25	25 x 4 = 100	25	25 x 2 = 50		

4) The question state that the total number of legs was 146 legs.
So we now need to find out the total number of legs if there were 25 cows & 25 chickens.

The cows had 100 legs & the chickens had 50 legs. So we add them up to find the total for both animals.

Since our calculation does not match with the question, the check is 'Wrong'.

Number of cows	Total cow legs	Number of chickens	Total chicken legs	Total cow & chicken legs	Check
25	25 x 4 = 100	25	25 x 2 = 50	100 + 50 = 150	X

5) The question state that the animals had a total of 146 legs. But in our calculation, we got 150 legs.

If the total number of legs we got is **more than** what the question state (which is the case now – we got 150 legs but the question state 146 legs), we must **reduce** the number of animals which has **more legs** (which are the cows for this question).

So just now we assume that there were 25 cows. So now we reduce it to 24 cows.

So if we assume there were 24 cows, how many chickens will there be? Please remember that there were 50 cows and chickens altogether at the farm.

So, 50 animals – 24 cows = 26 chickens

Number of cows	Total cow legs	Number of chickens	Total chicken legs	Total cow & chicken legs	Check
25	25 x 4 = 100	25	25 x 2 = 50	100 + 50 = 150	X
24		26			

6) Then we will calculate the number of legs for 24 cows and 26 chickens.

Number of cows	Total cow legs	Number of chickens	Total chicken legs	Total cow & chicken legs	Check
25	25 x 4 = 100	25	25 x 2 = 50	100 + 50 = 150	X
24	24 x 4 = 96	26	26 x 2 = 52	96 + 52 = 148	X

Now the total number of legs that we got is 148. But the question wants it to be 146.

So again we reduce the number of cows. Remember, since we want to bring the total number of legs down, we need to **reduce** the number of animals with more legs (which are the cows!).

Number of cows	Total cow legs	Number of chickens	Total chicken legs	Total cow & chicken legs	Check
25	25 x 4 = 100	25	25 x 2 = 50	100 + 50 = 150	X
24	24 x 4 = 96	26	26 x 2 = 52	96 + 52 = 148	X
23	23 x 4 = 92	27	27 x 2 = 54	92 + 54 = 146	✔

7) Now the total number of cow & chicken legs is 146. It matches with the question!

Question solved!

Ans : 23 *cows*