

Problem of the Week, AY 2007 12 April 2007
Circle One: Faculty (non USMA)
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Problem 21

A conversation between a census worker and a mother:

Census worker: Ma'am, how many children do you have?

Mom: I have three daughters.

Census worker: What are their ages?

Mom: Well, if you multiply their ages, you get 36. If you add them, you get our street address number.

The census worker went outside to check the address and came back.

Census worker: Ma'am, I am not sure of their ages yet.

Mom: I am concerned about the oldest one. She is having some trouble memorizing the multiplication table. She is some years behind her peers in arithmetic.

Census worker: I see. Thank you very much.

The census worker moved on to the next house.

What are the daughters' ages?

Answer: 9, 2, and 2

Solution: After the first criterion, the possible ages for the girls are 36, 1, 1 (sum 38); 18, 2, 1 (sum 21); 12, 3, 1 (sum 16); 9, 4, 1 (sum 14); 9, 2, 2 (sum 13); 6, 6, 1 (sum 13); 6, 3, 2 (sum 11); or 4, 3, 3 (sum 10). Since the census worker still couldn't determine the ages by looking at the street number, the street number must correspond to the sum of more than one set of ages. Thirteen must be the street address, then. The last answer by the mom makes us realize that only one daughter is the oldest, so the ages must be 9, 2, and 2. Of course, this logic could be flawed if we consider the possibility of the daughters being 6, 6, and 1, yet the 6 year-olds aren't twins, but rather separated by 9 to nearly 12 months. Even in this case, however, the mom's last clue clarifies that the ages are 9, 2, and 2 since a 6 year old who can't memorize her multiplication table can't be considered "some years behind her peers" as a result.