AGE PROBLEMS

While participating in a census, a census-taker arrived at a certain house in a certain street and proceeded to question the woman who answered, as to the number and ages of the occupants.

When asked how many children lived at the address and their ages, she agreed only to supply their number, which was 3. She told him he, the census-taker, would have to work out their individual ages from clues she supplied.

The first clue given was that the product of their ages was 36.

The second was that the sum of their ages was equal to the number of the house next door.

The census-taker, at this stage, claimed that for certain age identification, he required one more clue.

Reluctantly the woman retorted that the eldest played the piano.

With this, the census-taker was able to make positive age identification, and moved to another house.

(See page 36)

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Explanation of "Find the Error" in Vol 7 No 2

1. For $x = \pi$, we have to take the negative square root of $1 - \sin^2 x$.

2. $\sqrt{-1} = \pm i$; $\sqrt{1} = (i)(-i)$.

3. The derivatives of both sides are the same $= 1/x$; evaluation of both sides between $x = a$ and $x = b$ will be the same too. Indeed, what we have obtained is two primitive functions of $1/x$ which differ by an additive constant as we should expect. It is perhaps a dreadful warning on the peril of thinking that all primitive functions of the same original function are the same.

4. The proof that the binomial theorem is true for non-negative integers n in fact only covers $n > 0$; the induction starts at showing it true for $n = 1$. However if we use the general proof that

$$(1+x)^n = 1 + \frac{n}{1}x + \frac{n.(n-1)}{1.2}x^2 + \ldots$$

based on Maclauren's Theorem, we find this true for all n, including zero, provided $|x| < 1$. (Otherwise the infinite series will not converge.)

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