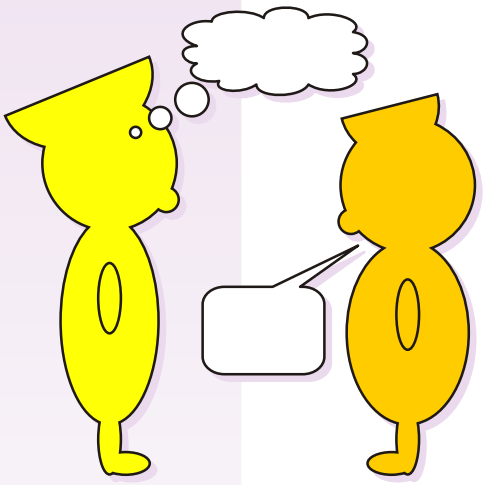
Mini-Contests

Deaf Conversation*

This puzzle I found in an magazine here in Brazil (where I live). I know how to solve it and i THINK you don't know it yet. So i'm challenging you or the visitors of your site to solve it.
Thiago A. S.



One day walking in a street, Caesar meets his old math teacher. Happy to meet him, he says hello to the teacher but he doesn't remember that his teacher answers everything with a puzzle:
-- How are you doing, professor? It's been a long time since we don't meet! Are your daughters ok? How old are they now?
-- Multiplying the three ages you get 36
-- But that's not enough to know the ages!
-- So, add up the ages and you'll get the number of that house.
Caesar starts calculating, but still can't figure out. The professor seeing that he wouldn't be able to find the answer says:
-- The oldest girl plays the piano...
That's what Caesar needed to know to figure out the problem. How old is each girl?

---
* This puzzle is a version of the problem titled "The child with the wart" and published by Martin Gardner in his famous column in Scientific American (November, 1970), and then - in Martin Gardner's tenth puzzle book "Wheels, Life and other Mathematical Amusements."

Mini-Contests

Deaf Conversation (solution)

We got a lot of your solutions and show some of them to illustrate the correct solution to this clever puzzle.

Solution by Jason Meyers

There are 8 combinations of 3 numbers that equal 36 when multiplied, and their sums are in parenthesis:

1, 6, and 6 (13)
1, 4, and 9 (14)
2, 3, and 6 (11)
2, 2, and 9 (13)
3, 3, and 4 (10)
1, 3, and 12 (16)
1, 2, and 18 (21)
1, 1, and 36 (38)

Caesar could easily figure this out, but doesn't know their ages yet.

When told their sum is the same as the house across the street, Caesar can look at that number and quickly find out which of these combinations is correct, unless the number of the house is 13, for which there are two possible sums.

Since he cannot solve the problem by knowing the house number, 13 must be the number of the house.

When told that the eldest daughter plays piano, he knows that it cannot be the 6, 6, and 1 combination because their isn't an eldest as the twins are the same age, while the 2, 2, and 9 combination has an eldest at age 9, so that must be it.

Mini-Contests

Solution by Jensen Lai

The three ages multiply to give 36. The possible combinations are as follows:

1,1,36 total 38
1,2,18 = 21
1,3,12 = 16
1,4,9 = 14
1,6,6 = 13
2,2,9 = 13
2,3,6 = 11
3,3,4 = 10

Caesar knew the sum of the numbers yet still couldn't figure out the ages. Thus, the house number must have been 13. Knowing that there was an oldest girl, Caesar figured out that the ages were 2,2 and 9, not 1,6 and 6. Therefore, the girls are aged 2,2, and 9.

Solution by Marcus Dunstan

The girls' ages are 9, 2 and 2

Method:
Oldest girl must be either 18,12,9 or 6 (in order that the 3 ages can multiply to make 36)
Knowing the house number, Caesar should be able to determine the right ages UNLESS there are 2 combinations of the 3 ages that add up to the same number. There are:
9,2 and 2 (=13) and
6,6 and 1 (=13)
Because the teacher referred to his oldest daughter (in the singular) then the solution must be 9, 2 and 2!

Mini-Contests

Solution by Glenton Jelbert

The ages are 2,2 and 9.

Look at all the possible combinations of 3 positive integers whose product is 36. There are 8. The sum of the 3 numbers for these eight are 38, 21, 16, 14, 13, 13, 11, 10. Since the house number is not sufficient to tell the ages of the daughters the house number must be 13, corresponding to daughters ages of {1, 6, 6} or {2, 2, 9}. Since there is an eldest daughter it must be the later.

Solution by Tina Nolte

The ages of the daughters are: 9, 2, and 2.
The thing to note is that the third statement of the teacher revealed two things: the first two statements underdetermined the answer and knowing there was a unique oldest would allow us to determine which set of ages was correct. Considering the set of natural numbers that would multiply to 36 and would add up to the same number as some other such set of numbers gives us only two (multi)sets: (2, 2, 9) and (1, 6, 6). However, the statement about the oldest playing the piano tells us that there _is_ an oldest, so it must be the multiset (2, 2, 9).

Solution by Kimberly Puen

The girls are ages 2, 2, and 9
2x2x9=36 2+2+9=13 (similar to 1+6+6=13, but there's an oldest girl)