APSU Math Problem of the Week

Problem #5: A Riddle for the Ages

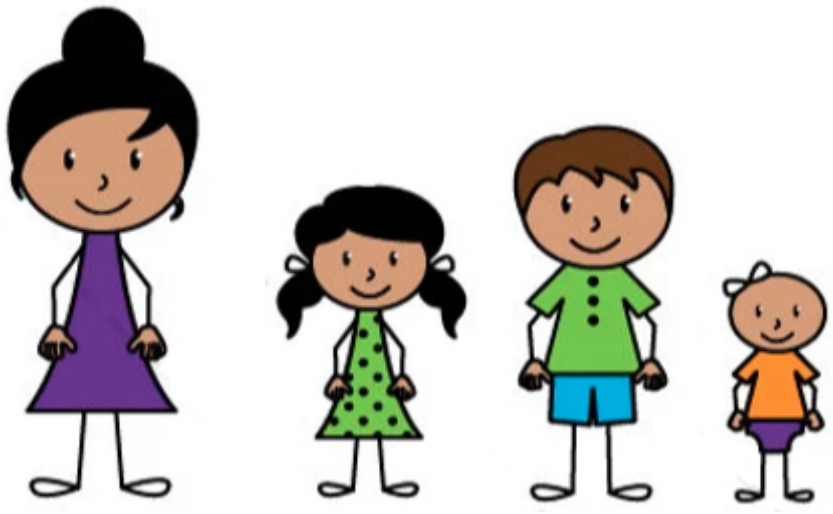
A census worker visits the home of a woman. After he knocks on her door, she answers and he can see three kids behind her. He asks about the ages of the children. She says, "The product of their ages is 72. And the sum of their ages is the number on the door." He checks the door, thinks about it a minute, and then says "I need more information." She replies, "The oldest one likes strawberries." He immediately figures out their ages.

How old are the children?

Solution: Since they are children, we can safely assume their ages are 18 or below (though the answer wouldn't change if you did consider possible ages like 1, 1, and 72), which means there are 9 ways their ages could multiply to be 72. Those are shown below with their sums calculated as well.

$3 \times 4 \times 6 = 72$	$3 + 4 + 6 = 13$
$2 \times 6 \times 6 = 72$	$2 + 6 + 6 = 14$
$3 \times 3 \times 8 = 72$	$3 + 3 + 8 = 14$
$2 \times 4 \times 9 = 72$	$2 + 4 + 9 = 15$
$2 \times 3 \times 12 = 72$	$2 + 3 + 12 = 17$
$1 \times 8 \times 9 = 72$	$1 + 8 + 9 = 18$
$1 \times 6 \times 12 = 72$	$1 + 6 + 12 = 19$
$2 \times 2 \times 18 = 72$	$2 + 2 + 18 = 22$
$1 \times 4 \times 18 = 72$	$1 + 4 + 18 = 23$

The answer can't be ages that sum to a unique value, otherwise he could have determined them from the clue about the sum being on the door. Therefore, they children must be 2, 6, and 6 or 3, 3, and 8. The fact that she has an oldest one, regardless of whether the child likes strawberries, implies they must be 3, 3, and 8 years old.



Feel free to take this printout, or find each Problem of the Week by scanning this:

Complete the problem each week for a chance to win a prize

Rules:

1. Any APSU student can submit a solution individually, or work can be done in a small group of 2 or 3 students.
2. Solutions must be justified when appropriate to be considered correct.
3. Submissions can be made to Dr. Brad Fox (MMCS 109) or electronically to foxb@apsu.edu
4. Problems will be posted each Friday afternoon with submissions due by the following Friday at 12pm. Solutions and the weekly winner will be posted once the deadline has passed.
5. One correct submission (whether submitted individually or as a group) will be randomly chosen to win a prize such as gift cards, Galois Math Club t-shirts, and APSU CoSTEM swag, in addition to receiving the glory of having their success published on this webpage.
6. Faculty and other non-students can submit solutions, but are not eligible for prizes.