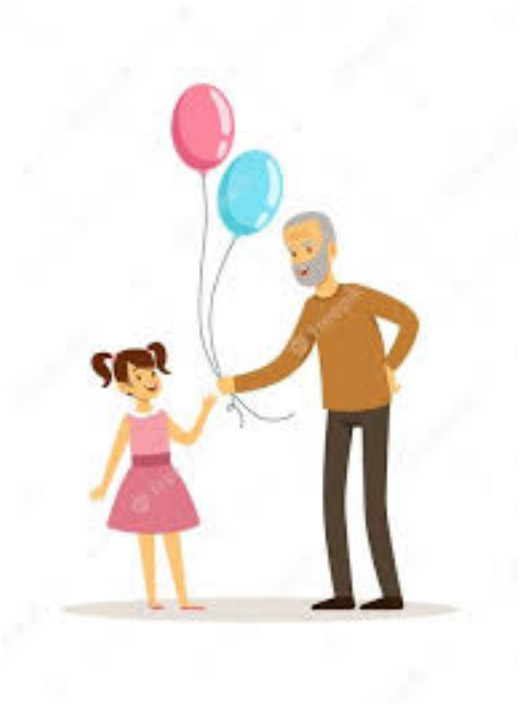
APSU Math Problem of the Week

Problem #8: Another Riddle for the Ages

Submission Deadline: 10/29/2021 by 12pm to
Dr. Brad Fox in **MMCS 109** or by email to **foxb@apsu.edu**

A man and his granddaughter have the same birthday. For six consecutive birthdays, the grandfather's age is a multiple of her age. How old is each after the sixth of these birthdays?

After the sixth birthday, the girl would be 6 years old and her grandfather is 66. One way at arriving at this answer is to realize that in order for his age to be a multiple of hers for 6 straight years, his ages would have to fall between between consecutive prime numbers, such as between 89 and 97 or within an interval like 53 to 58, 61 to 66, or 73 to 78 with her age being 1 initially. Having 91 only be a multiple of 7 and 13 with 92 only being a multiple of 2, 4, 46, and 92 eliminates that interval from consideration. Of the three other intervals to consider, you need the 5th grandfather age to be a multiple of 5, so only 61 to 66 works, with $61 = 1 \cdot 61$, $62 = 2 \cdot 31$, $63 = 3 \cdot 21$, $64 = 4 \cdot 16$, $65 = 5 \cdot 13$, and $66 = 6 \cdot 11$.



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.