

Birthday Math

Lara Ramsey

(continued from page 256)

There are multiple ways to explore the Birthday Math problems:

- Use a number line or another kind of picture to model the problem.
 - Use everyday language to express the pattern found.
 - Use algebraic notation to express the pattern.
1. It is not a coincidence. There will always be a year when a child will turn the age of the year the mother was born and the mother will turn the age of the year her child was born. It is also true for children and their fathers.
 2. This pattern holds true between any two people of different ages. For example, if person A is born in 1940 and person B is born in 1943, person A turns 43 the same year person B turns 40.
 3. This pattern holds true if the birth of person A and the birth of person B cross from one century into the next.
 4. Yes. Below are three examples:
 - a. Add the tens digits of the two birth years together; this will tell you the tens digit of the year when this pattern occurs.
 - b. Use number lines: There are three number lines at play at once in this problem. One is a timeline of birth years, and the other two are timelines of ages for

person A and person B. In this example, person A is born in 2007 and person B is born in 2010. In 2017 (the sum of the years of their births [in the tens place], $17 - 10 = 7$ and $17 - 7 = 10$). (See the number lines at the bottom of the page.)

$$(A + B = C; C - A = B; C - B = A)$$

c. Fill out a chart.

	Mom	Child
Age	79	53
Birth year	1953	1979
Current year	2032	2032

In the year that is the sum of the mother's birth year and the child's birth year,

mother birth year + mother age = child birth year + child age.

Although the numbers being added represent two different things (years and ages), the commutative property of addition still applies ($A + B = B + A$). For example, in 2032,

$$'53 + 79 = '79 + 53.$$

Note. Please contact the author at lr Ramsey@smith.edu if you think of other ways to describe or model this phenomenon.

Timeline:

2007__2008__2009__2010__2011__2012__2013__2014__2015__2016__2017

Person A:

0__1__2__3__4__5__6__7__8__9__10

Person B:

0__1__2__3__4__5__6__7