

## Solution - Challenge of the Week

### *Challenge of the Week # 2 - September 4 to September 11, 2009*

There are 12 members of a certain club. Last year, each member sent a birthday cake, with candles, to every other member. (That was a lot of cakes!) Of course, the cake is sent on the person's birthday and the number of candles on the cake was equal to the age of the person receiving the cake. Is it possible that the total number of candles was 2008? Justify your answer.

The best solutions to this week's challenge were submitted by Hilary Cloe, Rebecca Dunning, Jon Harter, and Alex Meadows. William Petersen, Ashlee Sharp, Cydnee Tucker, and Emily Weinberg also provided correct solutions. Partial solutions came from Natalie Clark, Michael Jensen, Vicki Kane, Joseph Leipert, Caitlin Lyman, Katie Rahn, and Josh Rappuhn.

**Solution:** Consider the problem from the birthday person's point of view. He or she receives 11 cakes with the same number of candles. Hence, the number of candles on the cakes he or she receives is a multiple of 11. Adding up the number of candles each person receives over all 12 members gives the total number of candles and is a multiple of 11, because the sum of multiples of 11 is a multiple of 11.