Problem of the Week

Proposed by Bernardo Ábrego and Silvia Fernández.   **September 20-27**

Today, September 20, 2004, is my birthday and I noticed a curious fact: My father's age (in whole years) is exactly twice mine (also in whole years). I wonder how many days, including today, can this happen. In other words, how many days can my father's age be exactly twice my age? Since you do not know my age or my father's, I will at least tell you that my father's birthday is not February 29th.

Make sure you explain why your answer is correct.

Solution by Chris Dungan.

No February 29 birthdays or occurrences in the next 3 years. All ages discussed in whole years.

September 20, 2004: If your birthday is today and your father is now twice your age, he will remain so through the day before his next birthday. A year after this birthday, he will become 2 years older than he is today. Between now and that day, you will have had one birthday—unless his birthday is also September 20, in which case there are 365 days when his age is twice yours—therefore he will again be twice your age through September 19, 2006 (the last day you are a year older than you are now). Of the 730 days from 9/20/04 through 9/19/06, the 365 days when your father is a year older than he is now do not fulfil the condition that you are half your father's age, whereas the remaining days do. Therefore, no matter when your father's birthday is, his age is twice yours for 365 days.