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September 1997

Regulars

## Puzzle No. 3 – birth dates



On John's 21st birthday his mother's age is 39. John adds the digits of his mother's age to get  $3+9 = 12$ . He then repeats this process to get  $1+2 = 3$ . Once he gets to a single digit he stops. He applies exactly the same process to his own age and gets 3 again.

He repeats this calculation for his next birthday, the birthday after that and so on. To his amazement, repeatedly adding the digits of his mother's age always gives the same value as repeatedly adding the digits of his own age. It seems that he and his mother share a *special numerical relationship*.

John then investigates whether he shares this numerical relationship with his father. On John's 21st birthday his father's age is 46. Adding the digits gives  $4+6 = 10$  and adding again gives  $1+0 = 1$ . Alas not! Furthermore, he discovers that he never does.

This age relationship between parent and child is not uncommon. What property must the parent's age have on the day the child is born if they are to share this numerical relationship?

We will publish the best solutions in the next issue, along with the answer to the problem itself. Please submit your answer, with explanation, to [Any comments?](#)

## Acknowledgement

This puzzle is based on the contribution by Prof. J.C.R. Hunt in "The IMA Bulletin", Volume 31, Nos. 1/2, January/February 1995.

## Solution

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*Plus* is part of the family of activities in the Millennium Mathematics Project, which also includes the [NRICH](#)

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and MOTIVATE sites.