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## JMO Sequence Questions

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**Level: Junior Ref No: J26**

**Puzz Points: 11**

In a sequence, each term after the first is the sum of the squares of the digits of the previous term. Thus if the first term were 12, the second term would be  $1^2 + 2^2 = 5$ , the third term  $5^2 = 25$ , the fourth term  $2^2 + 5^2 = 29$ , and so on.

- (i) Find the first five terms of the sequence whose first term is 25.
- (ii) Find the 2001<sup>st</sup> term of the sequence whose first term is 25.

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**Level: Junior Ref No: J32**

**Puzz Points: 11**

A 3 x 3 grid contains nine numbers, not necessarily integers, one in each cell. Each number is doubled to obtain the number on its immediate right and trebled to obtain the number immediately below it.

If the sum of the nine numbers is 13, what is the value of the number in the central cell?


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**Level: Junior Ref No: J42**

**Puzz Points: 15**

In a sequence of positive integers, each term is larger than the previous term. Also, after the first two terms, each term is the sum of the previous two terms.

The eighth term of the sequence is 390. What is the ninth term?

